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VALIDATION OF THE HOFFER-OSMOND DIAGNOSTIC TEST  
ON AN ADOLESCENT SAMPLE

BY

 LLOYD JOHAN NJAA

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

SPRING, 1972





Thesis  
1972  
47D

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Validation of the Hoffer-Osmond Diagnostic Test on an Adolescent Sample" submitted by Lloyd Johan Njaa in partial fulfilment of the requirements for the degree of Doctor of Philosophy.



## ABSTRACT

The purpose of this study was to validate the Hoffer-Osmond Diagnostic Test (HOD) on an adolescent sample. The HOD was originally developed to be a measure of perceptual distortions. HOD scores are reported to discriminate schizophrenics from non-schizophrenics. The HOD consists of 145 items which yield basically four scores - Total Score, Perceptual Score, Paranoid Score and Depression Score.

The writings of Combs and Snygg (1959) and Rogers (1951) on the role of perception on behavior were employed as the theoretical basis for this study. They theorize that an individual's behavior is a function of the way the individual perceives himself and his environment at the instant of behavior.

The relationships of perceptual distortions to a number of psychological constructs was discussed.

Hypothesis testing for the validation of the HOD involved two procedures. First, construct validation involved determining the relationship between the HOD scores and several constructs. Secondly, concurrent validation involved determining the relationship between the HOD scores and scores on an established psychological instrument.

Specifically, it was hypothesized that students who drop out of school, students who are underachieving, students who obtain a high rate of absenteeism and students who seek counselling or are referred to agencies outside the school would obtain higher scores on the HOD than students in the control samples. In addition to these variables, the relationships between HOD scores and IQ, age, sex, and socioeconomic



status were also investigated. Finally, the relationship between HOD scores and Minnesota Multiphasic Personality Inventory (MMPI) scores were investigated.

The subjects for this study consisted of a random sample of 875 grade 10 and 11 students from Jasper Place Composite High School in Edmonton, Alberta and 31 students who had been referred to the Visiting Psychologists; these students being from a number of other high schools.

Although not all the HOD sub-scores discriminated equally well between the criteria groups and control groups, an examination of the differences through analysis of variance and/or analysis of covariance of the HOD scores obtained by the various criteria groups and control groups permitted the following conclusions: high HOD scores are typically obtained by students with a high rate of absenteeism, students who are underachieving, students who seek counselling, students referred to agencies outside the school, students from the lower socioeconomic status and students with low IQ scores.

Females tended to have higher HOD scores than males.

HOD score variance was determined to be relatively independent of age. Furthermore, the HOD scores of students who dropped out of school were not significantly different from the HOD scores of students who stayed in school.

Hypotheses predicting a positive relationship between the Total Score, Paranoid Score and Depression Score on the HOD and Schizophrenia Scale, Paranoia Scale and Depression Scale of the MMPI respectively, were supported.



Findings were interpreted as evidence that the HOD is a valid measure of perceptual distortions among high school students. Implications for the use of the HOD by school counsellors to identify disturbed individuals was discussed.





## ACKNOWLEDGMENTS

The writer wishes to express his sincere appreciation and thanks to the following persons for their assistance during the preparation of this dissertation:

Dr. H. W. Zingle for his time, patience, consistent encouragement and helpful criticism; Dr. D. D. Sawatzky, Dr. H. W. Wojcicki, and Dr. A. Shysh for their constructive criticism; Dr. H. Kelm who was instrumental in introducing to the writer the HOD and who also graciously consented to act as external examiner; the high school administrators and teachers at Jasper Place Composite High School in Edmonton, for making it possible to carry out the necessary testing procedures; and the school psychologists of the Edmonton Public School System for supplying the test results on some of their referrals.

Finally, special recognition is expressed to the members of my family; to my parents for their continued interest and concern; to my boys, Bradley and Douglas, who had to accept changes in their life style without really understanding the reason for these changes during the writing of this thesis, and to my wife Helen, whose continued encouragement, interest and psychological support, as well as clerical assistance, helped make the writing of this thesis less tedious than it might have been.



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## CHAPTER I

### INTRODUCTION

Stability and continuity in perception are the rule rather than the exception (Zingle, 1970). Even though the stimuli impinging upon the sense organs are constantly changing, the human organism does as a rule perceive the world in an orderly and stable manner. Sometimes, however, everyday perceptions are distorted perceptions of reality. Perceptual distortions have therefore become very important in the understanding of basic perceptual processes (Wittreich, 1965).

Counsellors, psychologists and psychiatrists have long been aware of the fact that some people have distorted perceptions of themselves, others and the environment in general. In the process of therapy, the client reveals not only his behavioral problem but also often the distorted perceptions related to the behavioral problem. By dealing with the individual's perceptions in the therapeutic situation, the client's perceptions are often changed and the behavioral problem is also corrected (Cameron, 1963; Cancro, 1970; Combs and Snygg, 1959; and Rogers, 1951).

Historically, counsellors and psychologists have theorized the importance of the relationship between perception and behavior when dealing with disturbed individuals. Adler (1927) stressed the importance of consciousness of self-perceptions in his individual psychology. He theorized that in order to help an individual it was necessary to see with the helpee's eyes and hear with the helpee's ears. Following







from the individual psychology of Adler, Sullivan (1938) and Horney (1951) theorized that an individual's pattern of behavior developed from interpersonal interactions. Disturbed individuals typically experienced anxiety in interpersonal relations which resulted in unfavorable interpersonal relationships.

More recently, the relevance of an individual's perceptions to his behavior has been presented by Combs and Snygg (1959), Jourard (1959), Jersild (1952), Kelly (1963), Maslow (1954), Perls (1969) and Rogers (1951). These theorists have suggested that the particular patterns of behavior exhibited by an individual are related to the unique perceptions that the individual has made of himself, others and the environment in general. If an individual's perceptions are distorted then a disturbed pattern of behavior emerges.

Some exponents of group counselling also place emphasis on the self-perceptions of the client. Burke and Bennis (1961) and Perls (1969) suggest that in small group situations individuals reveal their attitudes, feelings and perceptions. These attitudes, feelings, and perceptions are explored and discussed with the members of the group, often resulting in changes in an individual's perceptions of himself and others and ultimately changes in the individual's behavior.

Some psychiatrists have also written about the perceptual distortions of their clients. These distorted perceptions in the form of hallucinations or delusions are considered symptoms of certain mental dysfunctions -- particularly schizophrenia and paranoia. These clients have perceptions of themselves and others that result in behavioral patterns which conflict with standards of society. These conflicts are



basic to the complexity of an individual's psychopathology (Cameron, 1963).

Holzman (Cancro, 1970) suggests that the active process of perception of an individual ". . . bears the unmistakable stamp of the perceiver's individuality (p.217)" which is affected by the individual factors of memory, needs and intentions.

A number of experiments have convincingly demonstrated that curtailing or distorting feedback will distort contact with reality and will diminish autonomous control over thought and acts; increasing or amplifying feedback on the other hand augments reality attainment and voluntary control (Holzman, 1970, p.217).

Hoffer and Osmond (1966) theorize that mental illness, particularly schizophrenia, is related to the way an individual handles perceptual, thought and mood changes. They contend that through a structured interview focusing on the individual's perceptions, thoughts and moods, a fairly accurate diagnosis can be made of the state of the individual's mental health.

Hoffer and Osmond (1961) developed the Hoffer-Osmond Diagnostic Test (HOD) to measure an individual's perceptual, thought and mood changes. They believed that the pertinent information about an individual's state of mental health, which is usually obtained through a structured interview, could also be obtained by a paper and pencil test. Further details about the scores obtainable from the HOD as well as the validity and reliability of the HOD are given in Chapter III.

On the basis of research, Hoffer and Osmond (1961, 1962, 1966) claim that the HOD is a useful tool in diagnosing perceptual distortions associated with mental illness. The higher the score on the HOD, the



greater the disturbance. They also claim that the HOD is a useful tool in monitoring the effect of therapy. As the client's state of mental health improves, his score on the HOD decreases.

The purpose of the present research was to attempt to evaluate the feasibility for school counsellors to use the HOD as a diagnostic tool. Paolucci (1969) has suggested that the adolescent period of life is characterized by physical changes, perceptual instability, rapid changes in thought and mood. These changes he contends, are often accompanied by changes in behavior which may take the form of truancy, threatened suicide, acting out in class and sexual promiscuity.

Although the HOD has previously been administered to several hundred high school students, the scores obtained by these students have not been studied in relation to school performance and behavioral problems encountered during high school. This research will investigate the relationship between the adolescent's scores on the HOD and the following factors; age, sex, intelligence quotient, absenteeism, school achievement and socio-economic status. Also considered in this study will be the students who drop out of school, students who seek counselling and students who are referred to agencies outside the school. From this investigation it should be possible to conclude whether or not the perceptual distortions as measured by the HOD are relevant to adolescent behavior.

If the scores on the HOD are found to be related to adolescent behavior, the HOD may become a very useful tool for school counsellors. The HOD could be administered to all the students in a high school for the purpose of identifying disturbed students. The school counsellor





could then begin therapy with the disturbed students or if necessary, the more disturbed students could be referred to other professional people such as psychiatrists and psychologists. Furthermore, early diagnosis of the disturbed individual may prevent the problem from becoming so severe that prognosis is very poor (Kowalson, 1967).

### Summary

The relationship which exists between perceptual distortions and individual behavior has been theorized and demonstrated by many theorists and researchers. These theorists have basically suggested that perceptual distortions are related to disturbed behavior. Hoffer and Osmond (1962) developed a test to measure perceptual distortions. This research will attempt to validate the Hoffer-Osmond Diagnostic Test, as a diagnostic tool, of perceptual distortions related to disturbed behavior, on an adolescent school sample.





## CHAPTER II

### THEORETICAL CONSIDERATIONS

#### Introduction

The purpose of this chapter is to present the theoretical considerations upon which this research is based. Included in this chapter is a discussion of the perceptual approach to behavior, and a theory on the relationship between physiological factors and perception.

#### Perceptual Theory of Behavior

The present study is based on a perceptual theory of human behavior. The basic idea of this theory is that a human being, as a total organism, behaves in a manner which is consistent with the way he perceives himself and his environment at the instant of behavior. The past and future perceptions of himself and his environment are relevant only to the extent that these perceptions create tensions that influence present behavior (Combs and Snygg, 1959 and Rogers, 1951).

The emphasis is on the individual's unique perceptions, which cannot be completely shared with another person nor can they be completely verbalized by the perceiver. The best way to know another person's perceptions is to make inferences about his perceptions from observing his behavior.

People do not behave according to the facts as others see them. They behave according to the facts as they see them. What governs behavior



from the point of view of the individual himself are his unique perceptions of himself and the world in which he lives, the meanings things have for him (Combs and Snygg, 1959, p.17).

All the perceptions of himself and his environment that the individual is experiencing at the instant of behavior is called the phenomenal field (Combs and Snygg, 1959). Because the phenomenal field of an individual is constantly changing, and because the process of perception is an active on-going process, certain perceptions emerge as very important perceptions while other perceptions become less important. This process of the changing in relevance of certain perceptions is known as differentiation and makes possible changes in the perception of events. An experience at a given point in time may be perceived as being very threatening, whereas the same experience at another point in time may be perceived as not threatening at all (Combs and Snygg, 1959).

As the individual experiences his interactions with other people and the environment in general in order to satisfy his needs, certain attitudes, feelings and perceptions of himself become differentiated out of the phenomenal field and are internalized. These differentiated portions which become the essence of "I" and "me" constitute the individual's self-concept (Rogers, 1951).

As the self-concept develops, the individual is motivated to behave in such a manner as to enhance and preserve the self-concept. From the viewpoint of the behavior, therefore, all his behavior is caused, purposeful, reasonable and motivated toward enhancing and preserving the self-concept.



Individuals who are aware of a wide variety of experiences and who are able to adjust their self-concept to relevant perceptions are considered to be healthy individuals (Combs and Snygg, 1959). The healthy individual has self-identifying and self-evaluative thoughts which are not contradictory to his behavior. The healthy individual has a large capacity for differentiating his perceptions. This capacity for differentiation enables the individual to deal with threatening situations. The healthy individual also has the ability to interrelate with a wide variety of people. Relating to a variety of people enriches the individual's experiences which in turn promotes healthy perceptions. Not everyone, however, has healthy perceptions.

### Unhealthy Perceptions

Some individuals have unhealthy perceptions of themselves, others and their environment in general. These individuals perceive themselves as being incapable of achieving need satisfaction. The individual who perceives himself as being incapable of achieving need satisfaction is threatened by this perception of himself and tends to internalize negative feelings about himself such as: I am unable, I am unacceptable, I am unwanted, and I am unworthy. Since all behavior is determined by the individual's perceptions, negative perceptions about oneself will lead to behavior which will be judged undesirable by other people. The undesirable behavior to the behavior, however, is consistent with the way he perceives himself (Combs and Snygg, 1959). The conflict which arises between the individual's evaluative thoughts based on his own perceptions and the evaluative thoughts of other people leads to





anxiety, tension and threats to the individual's self-concept (Rogers, 1951).

The individual who is threatened reacts in one of two ways. Either the individual restricts his perceptual field or he employs defense mechanisms to protect his self-concept. If the individual restricts his perceptual field, he is not open to experiences which could alter his self-perceptions and eventually reduce the threat. On the contrary, the individual tends to focus on the experiences which enhance his negative self-concept -- this in turn further restricts the individual's ability to perceive and a vicious-circle kind of behavior results (Combs and Snygg, 1959).

If the individual employs defense mechanisms in order to deal with threat, the following three defense mechanisms are common. (1) The anxious person may project his threatening experiences onto someone else, (2) The anxious person may suppress the threatening experiences -- holding them at a very low level of differentiation, or (3) The anxious person may withdraw from the threatening experiences (Combs and Snygg, 1959).

Whatever defense mechanism the threatened individual may choose to defend his self-concept, the important thing to remember is that from the point of view of the behavior, his behavior is consistent with his perceptions of himself and his environment at the instant of the behavior.

Some individuals who possess unhealthy perceptions and display behaviors which are evaluated as being undesirable by other people, require the professional assistance of a counsellor, psychologist or psychiatrist in order to change the unhealthy perceptions.





### Therapy

Therapy consists of a therapist assisting a client to experience more adequate differentiations of his phenomenal self (Rogers, 1951).

As the therapist demonstrates that he understands and accepts the client, the client comes to realize that his unhealthy self-perceptions are being counteracted by the healthy experiences he is having with the therapist. These healthy experiences cause the client to perceive himself as being acceptable, able and worthwhile. These positive self-perceptions are verbalized and internalized into the individual's self-concept (Rogers, 1951). Since all behavior is determined by the way an individual perceives himself, others and the environment, the client, having changed his self-perceptions from unhealthy perceptions to healthy perceptions now behaves in an acceptable healthy manner (Combs and Snygg, 1959).

### Summary

Combs and Snygg (1959) and Rogers (1951) theorize that individual behavior is determined by the way an individual perceives himself, others and his environment at the instant of the behavior. To the behaver, his behavior is consistent with his perception even though his behavior may be judged undesirable by an outside observer.

As the individual experiences himself and his environment, certain perceptions of himself become integrated into his self-concept. These perceptions of self are enhanced and preserved by the individual.

All the experiences of an individual do not enhance or preserve the self-concept. Perceptions which do not enhance or preserve the self-



concept are perceived as threats to the self-concept. These threats often result in unhealthy self-perceptions and undesirable behaviors.

During therapy, a client is assisted to perceive himself and his experiences more accurately and more completely. Therapy often results in healthier perceptions of self which result in more acceptable patterns of behavior.

Although human behavior in this chapter has been presented from a psychological point of view, it is important to recognize that physiological factors may also influence the way an individual perceives himself, others and his environment. Diseases, physical handicaps and malnutrition are some of the physiological factors which Combs and Snygg (1959) recognize as influencing perception. The relationship between physiological factors and perception is discussed in detail in the next section of this chapter.

### Physiological Factors and Perception

Many psychologists, counsellors and educators devote very little attention to the relationship between physiological factors of a person and perception. Birch and Gussow (1970) maintain that in order to be effective, educational programs must consider biosocial factors in addition to sociological and psychological factors.

The biosocial theory of personality developed by Murphy (1947) suggests that both the organism and the environment must be considered together in order to understand human behavior. He proposes that man is a biological organism which has a definite interacting relationship with itself and the environment. There are four basic components of



personality according to Murphy (1947). There is a physiological component which is embedded in the genetic and embryological disposition; a canalization system which sets up certain basic patterns of behavior early in life; a conditioned response system which is created by repeated reinforcement from the environment; and the cognitive and perceptual habit system which results from canalizing and conditioning. It is apparent that the physiological aspects of the human are basic to this theory of personality. The behavior of the individual can be traced through his perceptions back to the physiological component of the individual.

Combs and Snygg (1959) agree with Murphy (1947) on the relevance of the physical structure to behavior. They suggest that adequate functioning of the sensory organs is necessary for adequate perceptions. Malnutrition, infection and fatigue are examples of how physical structure can limit an individual's perception by reducing mobility, reducing the range of interests and by focusing attention on the area of deprivation.

Blake and Ramsay (1951), in relating body chemistry to perception, suggest that behind every behavioral set there exist many physiological correlates and on the converse, that no physiological process is related to only one behavioral act. This implies that the perceptions of the individual may be related to or affected by several physiological processes.

These physiological processes may yield inadequate perceptions due to malnutrition, genetically endowed metabolism rates and diets deficient in certain necessary nutrients. Blake and Ramsay (1951)





indicate that there is a relationship between feeble-mindedness and the metabolism rate of amino acids, mental illness, pellagra and vitamin deficiencies.

Birch and Gussow (1970) and Allen (1970), working with lower class people have emphasized the relationship between physiological factors and the perceptual and cognitive abilities of individuals. They contend that physiological factors can restrict perceptual and cognitive activities.

Hoffer and Osmond (1962) and Cancro (1970) also place a great deal of emphasis on the role of physiological factors in mental illness and perception. Hoffer and Osmond's (1962) theory of schizophrenia is outlined in the next section of this chapter.

### Summary

In this chapter the theoretical positions of Combs and Snygg (1959) and Rogers (1951) have been presented. They theoretically explain human behavior as resulting from the way an individual perceives himself and his environment. Individual differences in perception lead to individual differences in behavior. Individual differences in perception result from the experiences of the individual in obtaining need satisfaction and from physiological factors such as illness, fatigue and malnutrition.

The relevance of physiological factors to perception is emphasized in Chapter III which outlines the theoretical bases upon which the HOD was developed.

Therapy consists of the therapist helping the client change his perceptions. This often results in changes in behavior.





## CHAPTER III

### HOFFER-OSMOND DIAGNOSTIC TEST

#### Theory

Hoffer and Osmond (1966) present their theory of schizophrenia upon which the HOD was developed. They believe that schizophrenia is a complex disease.

It affects the nervous system at its highest integrative levels, with a kind of disorganization which reverberates through the psyche not only of the sick person but also through those of his family and fellows (p.14).

They believe "there is a genetic predisposition or potential enzymatic defect which channels adrenochrome into adrenolutin (p.1)." An increased amount of adrenolutin interferes with the tissues of the brain responsible for perception. The amount of adrenaline available in the body is not directly related to the amount of adrenochrome. What happens to the adrenochrome, however, seems to be the important factor. The conversion of adrenochrome into adrenolutin is toxic and responsible for schizophrenia. The exact substance which converts adrenochrome into adrenolutin is not known (Hoffer and Osmond, 1966). Hoffer (1968) states that nicotinamide adenine dinucleotide (NAD) inhibits aminochrome formation. Because of this effect of NAD on adrenochrome formation and because the addition of nicotinic acid to cereal products in 1942 helped conquer pellagra, Hoffer and Osmond began treating schizophrenic patients with nicotinic acid and nicotinamide. Pellagra is a vitamin deficiency disease which produces psychiatric conditions very similar to schizophrenia (Hoffer, 1968).



One of the most significant factors related to schizophrenia is the number of perceptual changes which accompany the illness. Conolly described perceptual changes experienced by patients in 1849.

He thinks every familiar countenance changed. His senses became disturbed; he sees lights shining in the sky or appearances in the heavens. He feels heated. What he touches seems impure and what he eats or drinks tastes of poison (Hoffer and Osmond, 1962, p.2).

The perceptual changes experienced by individuals affect their behavior.

Patients react to disordered perceptions in a comprehensible way, but since their perception of the world varies in an unpredictable way their behavior will frequently seem to be inappropriate to others not sharing their strange experiences (Hoffer and Osmond, 1966, p.2).

In addition to the biochemical factor in schizophrenia, Hoffer and Osmond (1966) indicate that personality variables affect the way an individual handles perceptual, thought and mood changes. These personality variables account for the variations in behavior among schizophrenics. Although there is a wide variability in behavior among schizophrenics, schizophrenics do tend to resemble other schizophrenics in their behavior more closely than they resemble the behavior of people without schizophrenia.

Cultural factors, both familial and extrafamilial, are considered to be an effect rather than a cause of schizophrenia. Hoffer and Osmond (1966) believe that the presence of schizophrenia in a member of a family leads to changes in the family relationship rather than vice versa. Hoffer (1969) reported that he had treated with megavitamins several hundred people who had been referred for treatment but were not



schizophrenic. They were, however, relatives of schizophrenics. The result of this treatment seems to be preventative, since hardly any of the people referred became schizophrenics. "On the contrary, over 90% became normal (p.634)."

The duration of schizophrenia is also a factor in Hoffer and Osmond's (1966) theory of schizophrenia. The longer the duration of the illness the more difficult it will be to help the person. A lengthy exposure of the brain cells to adrenochrome can lead to permanent anatomical changes. Long duration to schizophrenia may inculcate undesirable personality traits and/or undesirable behavior patterns which are not accepted by the community to which the schizophrenic returns. This makes rehabilitation very difficult for the patient after leaving a mental hospital. Thus it is suggested that close contact with families of the schizophrenic be maintained in order to reduce the damage incurred by long continuing schizophrenia (Hoffer and Osmond, 1966).

Treatment of schizophrenia, according to Hoffer and Osmond's theory, takes into account perceptual and biochemical factors. As suggested earlier in this chapter, Hoffer and Osmond have been treating hundreds of schizophrenics with "nicotinic acid and nicotinamide in doses of 3 to 30 grams per day (Hoffer, 1969, p.631)." These chemicals reduce the effect of adrenochrome on the brain cells. In addition to chemicals, Hoffer and Osmond (1966) recommend the use of psychological and sociological means to ". . . reduce the damage caused by the impact of the illness and to hasten repair and reablement (p.17)."





To summarize, Hoffer and Osmond theorize that there is a genetic predisposition which has the effect of channelling adrenochrome into adrenolutin. Adrenolutin is toxic to brain cells causing changes to the individual's perceptions, thought processes and mood. Personality factors account for variation in behavior among schizophrenics. Family disturbances associated with schizophrenia are considered to be an effect of the illness rather than a cause. Duration of schizophrenia seems to be related to prognosis. Therapy for schizophrenics includes chemicals to lessen the effect of the biochemical factor and psychological and sociological means to aid in the changing of undesirable behaviors caused by the impact of schizophrenia.

### HOD Test

On the basis of the theory presented above, Hoffer and Osmond set out to develop an objective test. They assumed that the information relevant to diagnosing mental illness, which is often obtained by interviewing the client, could be obtained from the client by a paper and pencil test. Basic to this assumption is the fact that perceptual changes are symptoms of some mental disorders.

Some of the perceptual changes of schizophrenics associated with the sense modalities include visual and auditory hallucinations and distortions in the sense of smell, and sense of taste. The thought changes found in schizophrenics include blocking, delusions, ideas of persecution, paranoid ideation and bizarre ideas. The mood changes found among schizophrenics include anxiety, tension, emotional instability, irritability and restlessness (Hoffer and Osmond, 1961).





With the aforementioned perceptual changes in mind, Hoffer and Osmond analyzed the case histories of schizophrenic patients, stories written by ex-schizophrenics, accounts by recovered schizophrenics under the influences of LSD and reported perceptual changes of healthy individuals under the influence of LSD. LSD was used because the effect of LSD on healthy individuals produces perceptual changes very similar to the perceptual changes experienced by schizophrenics (Hoffer, 1966).

From the findings of the analysis of reports from schizophrenics, ex-schizophrenics, and healthy individuals under the influence of LSD, statements were constructed such that schizophrenics would tend to find the statements descriptive of their own perceptual experience. These statements constitute the HOD test.

The test consists of 145 items. The testee must read each item and indicate true or false as to whether or not that item applies to himself. Two items are given here as examples. For the complete test see Appendix A.

23. Sometimes I feel there is a fog or mist shutting me away from the world.

105. I usually feel alone and sad at a party.

There are six scales or scores that may be obtained from the HOD: Total Score, Perceptual Score, Paranoid Score, Depression Score, Ratio Score and a Short Form Score.

The Total Score consists of all 145 items. Three of the sub-scores, Perceptual Score (PerS), Paranoid Score (PS) and Depression Score (DS), consist of items from the Total Score which typically describe the experiential world of individuals diagnosed as having



unstable perceptions, paranoid tendencies and periods of depression respectively.

The Ratio Score (RS) is obtained by dividing the Total Score by the Depression Score. Kelm, Grunberg and Hall (1965) reported that the RS increased the power of the HOD to discriminate schizophrenics from non-schizophrenics.

The Short Form (SF) consists of 17 items from the HOD. Kelm, Chambers and Hall (1966) performed an item analysis on the test protocols of schizophrenics and non-schizophrenics. From this item analysis, the 17 items included in the SF seemed to make a sharper discrimination between schizophrenics and non-schizophrenics than the Total Score.

There are three items in the Paranoid Score which are also included in the Perceptual Score. With the exception of these three items, the other items in the Perceptual Score, Paranoid Score and Depression Score only appear once. The items of the Total Score on the HOD as well as the items of each of the sub-scores are provided in Appendix A. Also, the complete instructions for administering the test, scoring procedures and standard score sheet are included in Appendix A.

Reliability. Test-retest reliability on the HOD was obtained by administering the HOD to 358 patients in a psychiatric ward of a general hospital, 25 patients in a mental hospital, and 16 students from a teacher training college. The interval between the two testing periods was "1 to 7 days, 1 to 11 days and 14 to 69 days respectively (Kelm, Hoffer and Osmond, 1966, p.4)." The reliability coefficients obtained ranged from ".81 to .88 for the Total Score; .76 to .86 for the Perceptual Score; .62 to .79 for the Paranoid Score and .71 to .86



for the Depression Score (Kelm, Hoffer and Osmond, 1966, p.4)."

The split-half reliability coefficient on the Total Score was obtained on 1,143 psychiatric patients and 1,252 teachers' college, elementary and high school students. The reliability coefficients in the psychiatric patients ranged from .89 to .98, while in the student samples the reliability coefficients ranged from .87 to .99 (Kelm, Hoffer and Osmond, 1966).

#### Validity.

(i) Diagnosis. Several research findings have indicated that scores on the HOD differentiate schizophrenics from other psychiatric groups (Hoffer, 1966; Hoffer and Osmond, 1962; and Kelm, Chambers and Hall, 1966).

The Ratio Score (RS) was primarily introduced to differentiate schizophrenic from non-schizophrenic patients, excluding organic patients (Kelm, Hoffer and Osmond, 1966). A comparison of the scores obtained by schizophrenics, psychoneurotics, other psychotics and a character disorder group admitted to a psychiatric ward of the University Hospital, Saskatoon, Saskatchewan revealed that the RS was better than the TS at the .005 level of significance, for discriminating schizophrenics from non-schizophrenic patients (Kelm and Hoffer, 1965). A similar study was conducted on patients admitted to two mental hospitals in Saskatchewan. In both hospital samples the RS obtained by the schizophrenics were significantly different from the RS obtained by other psychotics, psychoneurotics and individuals with character disorders (Kelm, Grunberg and Hall, 1965).





Ward (1967) reported that the HOD was a valuable instrument in diagnosing perceptual distortions. He found some neurotics and individuals with character disorder obtained high scores on the PerS (Actual scores were not reported ). He started these patients on a daily dose of 3 grams of Niacinamide in addition to the other medications they were receiving. The patients started to improve almost immediately. The HOD scores of the patients decreased as their mental health improved.

Kowalson (1967) reported that the HOD was a valuable aid in identifying patients who suffer from metabolic dysperception. The common symptoms of metabolic dysperception are ". . . abnormal perceptions, with corresponding changes in thought, mood and behavior, who respond favorably to megavitamin B<sub>3</sub> and allied therapy (p.200)."

Seidler (1969) suggested that the HOD can show the changes in perceptions that are common in schizophrenia. He further suggests:

The HOD test is for the mentally disturbed what the electrocardiogram is for the heart patient. It either confirms or denies. It also measures improvement and establishes prognosis (p.118).

Peters (1970) hypothesized that individuals using hallucinogenic drugs would perceive their environment as being more distorted than non-users of hallucinogenic drugs. He administered the HOD to 1,051 drug users.

". . . novice marihuana smokers had average scores of 50 to 60; LSD users had scores of 70 to 90; while average scores for amphetamine users was 150"  
p.105.

Peters (1970) suggested that the individual's response to the items on the HOD was an indication of how the individual perceived himself, others and the environment in general.





The above research findings suggest the HOD can be a valuable aid in diagnosing perceptual distortions associated with some mental illnesses.

(ii) Prognosis. The HOD and also a biochemical test (mauve factor) have been recognized as useful tools in establishing prognoses.

Hoffer and Osmond showed that 1 out of 10 patients were readmitted to hospital within six months after discharge when their discharge score (TS) was 40 or less, compared to 6 out of 10 readmitted when the score was 41 or more (Kelm, Hoffer and Osmond, 1966, p.5).

Good prognosis was also related to the absence of the mauve factor, whereas poor prognosis was related to the presence of the mauve factor.

(iii) Biochemical measure. The Hoffer-Osmond theory of schizophrenia suggests that schizophrenia is related to a biochemical factor. One biochemical factor known as the mauve factor is present in the urine of many schizophrenics. Hoffer and Osmond (1962) reported a positive correlation between the mauve factor and scores on the HOD. By treating individuals who have mauve factor in their urine and high HOD scores with nicotinic acid and nicotinamide, the mauve factor disappears from the urine and HOD scores are lower.

The length of time a mental patient requires hospitalized treatment has been shown to be related to the presence of the mauve factor in the urine and perceptual distortions. Kelm, Hall and Hoffer (1968) reported that malvarians (individuals with the mauve factor) with high HOD scores were retained for hospital treatment longer than nonmalvarians with lower HOD scores.

(iv) Age. Hoffer (1963) reports that HOD scores decreased from age 13 to 26 years. His study included samples of public school, high



school and teacher's college students. Similar relationships between the HOD and age have been reported on a psychiatric population. This has led to the establishment of separate norms for patients 17 and under, 18 to 21 inclusive and 22 years of age and over (Kelm, Hoffer and Osmond, 1966).

### Review of Literature

A fairly large number of studies have employed the HOD in psychiatric hospitals and mental institutions. Since these studies deal with samples of patients who have been hospitalized, this summary of the related research will not include these studies. Rather, research findings more directly related to school-age subjects will be reviewed.

### School Achievement

Underachievement has often been considered a symptom of psychological problems (Wellington and Wellington, 1965; and Zingle, 1965). Several studies have established a relationship between school achievement and HOD scores. Green (1969) reported higher scores to be related to reading disability. Hoffer (unpublished paper) "reports that 15 year old students in grade eight obtained a mean TS of 52, grade nine - 40, grade ten - 33, and grade 11 - 25 (Kelm, unpublished chapter of a book)." Milner, Kelm and Pringle (report being prepared) reported that 15 and 16 year old students in grade nine to eleven had a median TS of 31, whereas 15 and 16 year old students in grade eight or less had a median TS of 102. Paolucci (1969) suggests that the HOD may be a useful tool to identify adolescents with perceptual problems. As a counsellor, he has been on the alert for students who have a sudden drop in school achievement, students who are truant, and students with distorted self-



concepts. To these students he administered the HOD and confirmed his suspicions about the presence or absence of perceptual changes. Kowalson (1967) administered the HOD to adolescents who were experiencing problems of adjustment due to physiological stress such as menstruation, and situational stress such as educational and occupational problems. She reported that the medical staff had diagnosed and helped many individuals whom she felt would not otherwise have received appropriate help. Kehoe (1969) reported on an experiment using the HOD on emotionally disturbed school-age children. During a period of seven months they found that 20 out of 52 children tested had total scores on the HOD of 60 plus. Of these 20, 17 were diagnosed by psychiatrists as having schizophrenia. From another study by Hoffer (1963 - unpublished) on grade nine students, the results indicated that the HOD could detect school failure and psychiatric problems before they occurred.

Later in the same year, without knowledge of the test results, a number of students were referred by their physicians for psychiatric attention and another group failed grade nine at the end of the year. An examination of the HOD test given at the beginning of the year showed a significantly higher proportion of the students in these two groups scored above established cut-off scores than all the other students who were not referred for psychiatric help and who passed grade nine (Kelm - unpublished chapter of a book).

Some of the aforementioned studies have dealt with students who have been referred to medical doctors, consequently, the research findings are based on a select sample. The studies carried on in schools, with the exception of the Paolucci study have reported the mean scores, obtained by students of various age groups, on the HOD. Paolucci (1969) seems to be suggesting, from his experiences using the HOD on adolescents, many possible uses for the HOD.





None of the above studies have considered such factors as intelligence, socio-economic-status, and school attendance. These factors should be considered in conjunction with HOD scores.

### Anti-Social Behavior

Smith (1969) used the HOD with delinquent boys. He reported that approximately 35% had relatively unstable perceptual worlds. He also reported that a few police officers were giving the HOD to offenders whom they suspected were mentally ill. Many individuals referred by the courts to psychiatrists for assessment had elevated HOD scores and responded favorably to megavitamin treatment. Smith suggested that the HOD could be used to help determine the risk of suicide and homicide among students in high school and college. Kowalson (1967) has used the HOD on individuals who presented "a. Abnormal attitudes and behavior, even in the presence of definite non-psychiatric disease; b. Frequent over-indulgence, by choice or compulsion, in the consumption of ethyl alcohol; c. Delinquency in its various manifestations (p.200-201)." Kowalson (1967) reported that by using the HOD in identifying individuals with metabolic dysperception, she had been able to help many disturbed individuals from reaching the point where "irreversible pathology has developed (p.200)." Paolucci (1969) suggested that ". . . acting out in class, taking drugs, becoming sexually promiscuous, threatening suicide and the like" are behaviors which would warrant an assessment of the perceptual world of the adolescent. Peters (1970) reported that users of hallucinogenic drugs had higher scores on the HOD than normals.





He also tested 24 pairs of parents of drug users and ". . . discovered that nine mothers, six fathers and nine pairs of parents had high test scores (p.105)."

#### Other Research Findings

Kelm (chapter of unpublished book) reported that the HOD scores on first year university students ". . . were significantly higher on the first day of menstruation than on the day immediately after menstruation ceased." Dalton (1968) reports a deleterious effect of menstruation on a school girl's work. The results from her research indicated that a girl suffers an average handicap of 5% when writing exams during paramenstruum.

Hoffer (1966) suggests that adolescent schizophrenics often have perceptual disturbances of which they are not aware, but admit to having them when measured by the HOD. These perceptual disturbances can lead to aberrant behavior and lack of control over this behavior.

The research findings mentioned above suggest a definite relationship between scores obtained on the HOD and specific unhealthy patterns of behavior.

#### Summary

Hoffer and Osmond's theory on schizophrenia suggests a basic biochemical factor related to schizophrenia. This biochemical factor seems to be related to perceptual, thought and mood changes which have a negative effect on the individual's behavior.

Since the HOD was initially developed to discriminate schizophrenics from non-schizophrenics, schizophrenics, other psychiatric



patients and healthy individuals have been included in the reliability and validity studies in the HOD.

During the last decade, the HOD has been administered to elementary and high school students, in order to assess the perceptual, thought and mood changes among school students. The present study is an attempt to relate the perceptual changes as measured by the HOD to some specific behavior patterns of high school students. The hypotheses to be investigated are discussed in Chapter IV.



## CHAPTER IV

### RELATED LITERATURE AND METHOD OF RESEARCH

#### Review of Literature

This chapter will present a discussion of the relationships between perception and various psychological constructs. From this discussion a number of hypotheses will be formulated. Basically, three types of construct criterion will be utilized to validate the HOD. First, the relationship between the HOD scores and variables such as IQ, age and sex will be investigated. Secondly, HOD scores from specific criterion groups such as students who drop out of school, students with a high rate of absenteeism, students who are under-achieving, students who seek counselling, students referred to agencies outside the school and students from the various socio-economic groups will be compared with control groups. These two types of criterion will be utilized to establish the construct validity of the HOD. Thirdly, the relationship between the HOD scores and scores on the MMPI will be investigated to establish the concurrent validity of the HOD.

#### HOD and Intelligence Quotient

A relationship between perception and intelligence is theorized by Combs (1952). He suggests that ordinarily, intelligence is inferred by the individual's behavior. Intelligent behavior is a function of the variety and richness of the individual's perceptual field. Variability in intelligence is thus related to the scope and clarity of the individual's personal field of awareness.



Combs (1952) distinguishes between potential and functional perceptions. Potential perceptions are all the perceptions that are potentially available to the individual under various circumstances. Any number of these potential perceptions may not exist at the moment of behavior. The perceptions which have direct bearing upon the individual's behavior at the instance of the behavior are called functional perceptions. It is Combs' contention that most intelligence tests measure only the functional perceptions. The measurement of the behavior based upon these functional perceptions yields a measure of the individual's functional intelligence, as distinct from a measure of an individual's intellectual capacity for intellectual behavior, which would also consider the potential perceptions of the individual.

A number of factors can be considered to limit the individual's perceptions. Injury to the central nervous system, physical handicaps to any of the sense modalities, malnutrition, focal infections, chronic fatigue, values, goals, beliefs, and threats to the self-concept are some of the factors which could affect the scope, differentiation and clarity of a person's perceptions and hence, the individual's intellectual behavior. The resulting behavioral pattern of the individual is either to restrict the number of stimuli attended to in the phenomenal field or to adapt defensive reactions toward the stimuli in the perceptual field. In either case the level of intellectual behavior is less than what it might be under other non-impairing, non-threatening situations. The level of intellectual behavior is thus negatively related to the individual's perceptual impairment and the individual's negative self-concept (Combs, 1952).





Piaget (Flavell, 1963) also associated intelligence with perception. For Piaget, both intelligence and perception are types of adaptation; intelligence being the far superior mode of adaptation. His theory of intelligence holds that the development of intelligence occurs by the individual adapting new stimuli to already existing mental constructs (schema). Behaviors which require ". . . judgment, inference, classification, reorganization (p.232)" are classed as intellectual rather than perceptual behavior.

Perception arises developmentally within the context of sensory-motor intelligence. Although Piaget chooses to measure intelligence and infer the relevance of perception, he does seem to indicate that intelligence is a function of differentiation. It would seem probable to hypothesize that the degree of perceptual differentiation attained by an individual would be an indication of intellectual function. On the converse, the degree of distortion of differentiation would indicate a lack of intellectual development. Piaget speaks of at least one type of distortion; that is, distortion associated with pre-adolescent development of intelligence.

Research on the relationship between perceptual distortions and intelligence is very limited. Much of the recent research that does exist on intelligence and self-concept has been associated with either socio-economic factors or the design of the research has controlled for intelligence. Wylie (1961), in reviewing all the research on self-concept, does not report one research where the relationship between intelligence and negative self-concept was investigated. Allen (1970), Jensen (Allen, 1970) and Birch and Gussow (1970) have indicated that individuals of lower intelligence in the lower socio-economic status



group tend to perceive themselves as being inadequate, worthless and unliked.

Williams and Cole (1968) report a relationship between mental abilities and self-concept at the grade six level. They believe reinforcement for success enhances the development of self-concept, whereas lack of reinforcement inhibits the development of self-concept.

Sanche (1968) reports a negative correlation between self-concept and intelligence. His study was on a group of mentally retarded children.

Research comparing intelligence with scores on the MMPI typically show a negative relationship. Dahlstrom and Welsh (1960), in reviewing the literature, indicate that the only scale that correlates positively with intelligence is the Mf (masculinity - femininity). The Hy (hysteria) scale seems to be inconsistent in various reports. All the other scales have a negative relationship with intelligence. They also reported that when the MMPI is used on a sample with a wide range of ability, small negative relationships are generally reported.

On the basis of the negative relationship between perception and intelligence which Combs (1952) and Flavell (1963) have theorized, and on the basis of the research findings presented, a negative correlation is hypothesized between scores on the HOD and Intelligence Quotient.

#### HOD and Age

Several theorists have suggested that the self-concept of the individual changes particularly during adolescence (Combs and Snygg, 1959; Erikson, 1963; Piaget - Flavell, 1963; Rogers, 1951).

A gradual change in the individual's perceptions is suggested by Combs and Snygg (1959). They postulate that the adolescent gradually changes his self-concept as he interacts with his environment. This



gradual change need not necessarily be a smooth change. Various types of circumstances may create traumatic changes. Tension and threat may be traumatic. Changes in body image may be traumatic. Cultural expectations of maleness and femaleness may be traumatic. The adolescent at puberty becomes particularly aware of body changes and sex roles. These factors would tend to leave the adolescent more vulnerable to perceptual distortions.

Piaget (Flavell, 1963) suggests that perception arises developmentally as a system within intellectual development. Perceptual development is characterized by a greater degree of clarity in perception. This developmental principle in the perceptual area is expressed as ". . . a gradual increase with age in behavior of the perceptual activity type, with consequent diminution in the force of the primary field effects (p.235)."

Rogers (1951) indicates that the self of an individual changes with age and maturation. This may result largely from the individual becoming aware of the values of other people that he has introjected in a distorted way and his attempt to drop these values and acquire his own values.

The acquiring of an identity is usually the task of the adolescent in our society (Erikson, 1963). The concept of identity is used to explain the confusion experienced by the adolescents as they progress from childhood to adulthood. With this transition, previous ideas, ideals and values are seriously questioned as well as the ideas, ideals and values of the adult society. This questioning often produces grandiose ideas, ideals and values of self and a futuristic society. The problem that usually arises is role confusion -- ". . . where this





is based on a strong previous doubt as to one's sexual identity, delinquent and outright psychotic episodes are not uncommon (p.290)." As the adolescent enters adulthood these grandiose ideas are often brought in line with reality and the individual becomes integrated into society without necessarily discarding all his adolescent ideas, ideals and values.

Frisk, Tenhunen, Widhom and Hortling (1966) and Mussen and Jones (1958) reported on the psychological problems associated with early and late-maturing. Late-maturing boys as compared with early-maturing boys, according to Mussen and Jones (1958) had feelings of inadequacy, strong feelings of being rejected and dominated, negative self-concepts, prolonged dependency needs, and rebellious attitudes toward parents. Frisk et al (1966) reported favorable mental development in early-maturing boys but late-maturing boys seemed to have mental stress. Early-maturing girls had greater anxiety and restlessness than late-maturing girls. Delayed development in both boys and girls led to an increased need for security. Peer and school adjustment was also associated with deviations in the rate of physical development. Early-maturing girls felt a need for older friends. This led to conflict over what was proper for the girls' chronological age. The self-esteem of the late-maturing boys was undermined because they often experienced failure in athletic and social activities as compared with their peers. The early-maturing boys and later-maturing girls seemed to experience far less frustration and anxiety so consequently performed much better scholastically as well.

Kowalson (1967) reported a greater degree of metabolic dysperception among adolescents and delinquents than adults and non-delinquent





adolescents. Paolucci (1969) reported perceptual changes among adolescents. These perceptual changes were in the form of illusions about themselves and the people they encountered.

Jorgensen and Howell (1969) hypothesized on the basis of psychoanalytic theory that the self-ideal self congruence would decrease during the latency period (5 - 12 years) and level off after the onset of puberty (13 - 18 years). They feel that during the latency period the superego becomes more important and along with this a greater degree of guilt feelings. After the onset of puberty the self-ideal self congruence stabilizes because of greater harmony between the ego and superego. Their research findings supported their hypothesis for males but not for the females.

Berdie (1960) also reported significant difference in personality between students entering high school and students entering college. For the females he found significant changes in terms of emotional stability, conformity and reality. For the males he reported significant changes in family relations, emotional stability, conformity, mood, and leadership behavior. For both males and females the older students were better adjusted.

Hoffer (1963) reported a study on 1,446 normal young people, males and females, ranging from ages 13 to 26 plus. The means on the HOD for each age group decreased with increased age. This suggests that greater perceptual stability is acquired with increased age. Kelm, Hoffer and Osmond (1967) reported a decrease in median scores with increased age. This was true for both psychiatric patients and normal subjects. They also indicated that females tend to have higher scores



than males. This sex difference was only reported on the normal subjects, ages 13 to 15 inclusive.

The aforementioned research findings have produced evidence to indicate that the period of adolescence in the life of an individual may be disturbed. Consequently, scores on the HOD could be expected to decrease with age.

### HOD and Drop-outs

The literature on the school drop-outs indicated that the factors associated with the drop-outs did not form a very consistent pattern. Rather, each drop-out appeared to have an individual pattern of contributing factors.

A review of the literature on the college drop-out by Marsh (1966) indicated that personality inventories were not as significant as attitude and value inventories in identifying the drop-out. Marsh (1966) concluded that the drop-out tended to have shallowness of motivation, poor study habits, immature attitude toward school, and greater need for dependence. He tended to be more anxious, have a higher incidence of character disorder and be more irresponsible and non-conforming.

Heilburn (1962) used his own Adjective Check List Needs Scale and identified low need for achievement among his drop-out sample. Johnson (1954) found a significant difference between drop-outs and non-drop-outs on the California Test of Personality. This difference was on the social adjustment scale. Drop-outs were more poorly adjusted. Slater (1957) claimed that the perception of the curriculum objectives



led to dropping-out. Students who perceived the objectives as being related to vocational choice persisted in college at a higher rate than students who perceived objectives as being related to a desire for college education but unrelated to a vocational choice.

The State of Maine Department of Education Study (1964) identified three characteristics of school drop-outs: (a) frustration (b) insecurity, and (c) a feeling of not belonging. Lewis (1966) suggested that the drop-outs do not accept the terms held by the school system. Thus they felt rejected and often failed. Nessier (1963) suggested that the stable, well adjusted youngster completed school, and the unstable, poorly adjusted youngster dropped out.

Millard (1964) summarized his clinical observations on students who drop out. He suggested that many drop-outs were not willing to deal with their feelings of defeatism and chose to withdraw from school rather than face up to the feelings of self-inadequacy. He also found the drop-out unable to evaluate and unrealistic in his perception as to what was happening to him or others who had dropped out. Millard states that the drop-out will counter the risks and problems of drop-outs ". . . with such an illusory and illogical self-confidence that it is best described as the product of a narcissistic personality complete with magic and wish-fulfillment fantasies (p.344)."

Millard (1964) maintains that the drop-out syndrome is a life-long process rather than specific acts of non-perception (denial) of reality or defensive reactions of repression or adaptive modes of flight. He suggests that rather than fostering good mental health, the school is a threat to the self-concept and self-esteem of its students.





This threat instills feelings of helplessness and anxiety. Rather than dealing with truancy and disinterest in school per se, Millard (1964) suggests that ". . . fear and anxiety, feelings of inferiority, hatred, aggressiveness, guilt and other mental disorder (p.34 )" should be considered in the total school program in order to facilitate well organized and stable personalities among school students.

Although the findings from the research presented do not indicate consistent personal characteristics among drop-outs, the clinical observations of Millard (1964) do indicate the existence of a drop-out syndrome. This study will investigate the extent of perceptual distortions among school drop-outs.

#### HOD and Referrals to Counsellors and Other Agencies

Several studies comparing students who seek counselling and students who do not seek counselling have used personality inventories. Rossman and Kirk (1970) administered the Omnibus Personality Inventory and reported a significant difference at .05 level between the two groups. Males tended to have greater personal anxiety, feel socially isolated, alienated, and have feelings of hostility and aggression. They described themselves as being tense, high-strung and having a poor opinion of self. Females tended to be more concerned about vocational choice. Cook and Kiesler (1967) administered the MMPI and the Welsh Anxiety Index to clients and non-clients. Clients had higher total MMPI scores at the .05 level of significance and also higher scores on the neurotic triad at .05 level of significance. The clients also had higher scores on each of the subscales of the MMPI. The male clients had higher scores on the Welsh Anxiety Index than non-male clients.





Female clients did not differ from female non-clients on the Anxiety Scale.

A significant difference between clients and non-clients was established on Edwards Personal Preference Scale. Students seeking counselling tended to be dominant and had more doubts about their self-worth than students not seeking counselling (Minge and Bowman, 1967).

Peck (1968) studied the suicide motivation in adolescents. He reported that the males referred to the guidance clinic were quiet, obedient, often studious and usually moody. The clients seemed to have high self-imposed internalized standards, dependency needs which were unsatisfied, conflict over sexual identity and adequacy, and perceived a need to attain maturity which caused emotional upset.

A General Practitioner has reported unstable perceptual conditions among many students referred to him for lack of school achievement. He often detects perceptual distortions very similar to the item on the HOD on these students. He reported success with these students by suggesting improved diets plus vitamin supplements (Green, 1969).

Another study on adolescents referred to the school psychologist or nurse (Milner, Kelm and Pringle - unpublished paper) indicated that these students had higher HOD scores than a normal population.

Paolucci (1969) reported distortion of the self-concept fairly common among the school student who sought counselling. He suggested that truancy, sudden change in personality, sudden drop in school achievement and negative feelings about one's family may be associated with perceptual instability.



Students seeking counselling tend to exhibit more disturbed personality characteristics on personality inventories than students who do not seek counselling. The HOD scores of students who seek counselling should also be higher than the HOD scores of students who do not seek counselling.

### HOD and Underachievers

The literature on the underachiever has usually focused on personality characteristics. One of the reasons for this focus has been the high incidence of intellectually bright students who are under-achieving.

The personality characteristics found among underachievers have been freedom from worry, somatic complaints, overevaluation of self, lack of social conformity and indifference to social responsibility. The overachiever, by contrast, has displayed more religious skepticism, initiative, perseverance, self-control, dominance, social skills, and extrovertive tendencies (Prouty, 1955, Roth and Puri, 1967, Backtold, 1969).

In an extensive review of the literature where underachievers were compared with overachievers, Taylor (1964) reported the following characteristic differences: underachievers had free-floating anxiety, negative self-concept, hostility toward authority, negative interpersonal relations, dependent unrealistic goals, and were socially oriented. By contrast, the overachievers had directed anxiety, positive self-concept, positive interpersonal relations, independence, realistic goals, and were academically oriented. To this list of characteristics Teigland, Winkler, Munger and Kranzler (1966) would add that the under-



achiever had a poorer sense of personal worth, was less self-reliant, lacked a feeling of belonging, showed a lower level of personal adjustment, and tended to use withdrawal as a defence mechanism.

Underachievers were reported to have difficulty adjusting to school. Hummell and Sprinthall (1965) indicated that the underachiever was less planful and thoughtful in his orientation to school, and displayed a fatalistic attitude toward his own effort in school.

A negative self-concept among underachievers has been reported by Brookover, Paterson and Thomas (1962); Fink (Hamachek, 1965); and Borislow (1962).

The perceptions of parents, teachers and others in contact with underachievers and achievers are reported to differ. Underachievers are perceived as being inadequate, inferior and unpopular. Achievers are perceived as being self-confident, acceptable and integrated in society (Eagle, Davis and Mazur, 1968). Wellington and Wellington (1965) reported that parents of underachievers felt they must pressure their children to achieve.

Social class is reported to be a factor in achievement. Wellington and Wellington (1965) and Chapiro (1967) reported that underachievers tended to come from lower socio-economic status where education was not valued, encouragement was seldom offered, home conflict and tension were prevalent, and fathers spent little time with the children.

Vaughan (1967) reported that underachievers had a tendency toward impulsivity and overactivity, coupled with a tendency not to stick to duty.





Underachievers tend to have distorted perceptions of self.

Zingle (1965) reported that underachievers had many irrational beliefs about themselves. Paolucci (1969) reported that drop in achievement was often accompanied by perceptual distortions of self.

On the basis of this research relating negative self-concept to underachievers, it is predicted that underachievers will have higher HOD scores than achievers.

#### HOD and Absenteeism

There are probably numerous factors which contribute to absenteeism. Illness, work, psychological factors, and failure are a few of these factors. Hodges (1968) conducted an extensive survey on non-attenders who had been prosecuted and/or the family had been prosecuted for poor attendance. He considered the physical environment, the family and the child. The two common characteristics of the physical environment were low income and instability (constantly moving). The physical environment of the school seemed to have no relationship with absenteeism. That is, the school building itself, recreation equipment and school facilities such as books, did not make any difference.

Characteristics common to the family unit of non-attenders were large families, poor parental attitude toward school, debts, illness, and other home problems. These factors seemed to cause passivity among non-attenders. The non-attender tended to be flaccid, helpless, and have unrealized good intentions (Hodges, 1968).

Hodges (1968) summarized his survey by suggesting that the home rather than the non-attender displayed common characteristics. It was





generally a home with a low level of general competence where health, intelligence, income, and domestic order were likely to be poor.

Feelings of inferiority, dislike of teacher, seeking of refuge in unrealistic fantasy, withdrawal from school activities, using retreat as a defense mechanism, and bad parental attitude were some of the characteristics Cooper (1966) found among her school refusers (non-attenders). She suggested that truancy was possibly a way of escape from discouragement and feelings of inferiority. Another possibility suggested by Cooper (1966) was that by staying away they were ". . . manifesting their need of security by a more positive, deliberate act of defiance (p.229)."

Attitudes toward school and life in general of the non-attender were studied by Wofford (1968). He developed a 40-item sentence completion test and administered it to a sample of truants. Attitudes toward life in general had no relationship with school attendance. The truants' attitude toward school stressed the difficulty of school, the lack of values in school and the inadequacy of college in satisfying personal needs.

The emphasis in the research presented on feelings of inferiority, need for security and personal perceptions on the value of school would suggest that the non-attenders would have negative self-concept and hence, a high score on the HOD.

#### HOD and Socio-Economic-Status

The theories and research on socio-economic status (SES) reviewed indicate that the various terms used to describe the members of the lower class varied considerably. Allen (1970) indicated that



lower social class, culturally deprived, the poor, and the disadvantaged were used interchangeably when referring to the group in a society characterized by limited educational training and limited economic income.

An individual's personality is a function of the cultural and familial factors. This implies that the social (cultural and familial) factors are relevant to the development of an individual's personality. The social influence upon personality is related to the way an individual views himself and his relationship to his environment (Mussen, 1963).

Unfortunately, SES studies do not control for cultural group differences. Bronfenbrenner (1967) studied a lower SES negro group of children and concluded that these children not only felt powerless but felt worthless as well. Generalizations from this study are difficult because of the cultural variable involved.

Sarbin (Allen, 1970) suggested that there are three psychological factors associated with poverty: time perspective, linguistic codes and locus of control. The time perspective of the poor is of a present perspective with very little consideration for the future. The review of the literature cited by Sarbin indicated the unwillingness of the poor to delay immediate gratification for future gratification. The linguistic code of the lower social class is restricted, undifferentiated and very simple. Bernstein (1961) supported this idea of limited linguistic code among members of the lower class. He suggested that poor perceptual discrimination, poor development of receptive and expressive modalities and limited contact with verbally mature adults were the factors which contributed to limited linguistic codes. Black (1965) and Raph (1965) also supported these findings.



The third psychological factor suggested by Sarbin (Allen, 1970) was locus of control. This concept was first suggested by Rotter (1966). The locus of control for the lower SES is largely external; that is, they perceive themselves as being largely controlled by forces in the environment rather than controlled by internal forces. Sarbin argues that this has the impact of giving them a "self-definition approaching the non-person (p.35)." The concept of "non-person" can be elaborated to mean a negative self-concept characterized by self-worthlessness, "helplessness, powerlessness and anomie (p.38)."

Pareek (Allen, 1970) believes that the various behavior patterns of SES groups are related to motivation of the members of SES groups and the role expectancy that higher SES groups perceive of them. He contends that the social system produces relevant motivational patterns for its members by reinforcement mechanisms which in turn enhance the social system. The behavioral patterns of the SES class according to Pareek are low need achievement, high dependency needs and low self-esteem which lead to lack of trust, cooperation and interaction with others. Clinard (Allen, 1970) reported similar results on a group of people in a slum area. He described these people as being apathetic, powerless, lacking in confidence, and having generally a poor self-image.

Birch and Gussow (1970) studied the relationship between school failure, nutrition and health. They presented fairly conclusive evidence that school failure is more prevalent among the poor. They contend that it is not a direct reflection of the SES per se, but that the level of nutrition and health care among the poor leads to poor achievement.





Not failing to acknowledge the reality of "cultural disadvantage", we would assert that it is but a fragment of the threats which a poor environment offers to the intellectual development of the child and that the poor, from conception until death, are also at differential risk with respect to a whole spectrum of physical hazards any one of which may be productive of intellectual deficit and educational failure (p.10).

The relevance of SES on the individual's self-perception has theoretically been shown to be important. The research findings reported to investigate the relationship between SES and self-perception are not very conclusive. Clausen and Williams (NSSE, 1963) have indicated that there are differences in value orientation, child-rearing practices, child behavior, and role expectation among SES groups. These findings support Sarbin's theoretical model presented above. When these differences have been researched in terms of self-perception, however, significant differences have been difficult to obtain.

Wylie (1961) surveyed the literature and concluded that rationally one could be expected to find differences in self-concept related to SES, but the evidence was not very convincing. Allen (1970) also reported several research findings which failed to establish a positive relationship between self-concept and SES.

Hees (Allen, 1970) suggested that attitudes associated with lower-class groups were low esteem, a sense of inefficiency and passivity. These attitudes were associated with the adaptive responses of the group rather than with the personality traits.

Butcher, Ball and Ray (1964) reported that SES and sub-cultural factors were found to influence MMPI test results. Dahlstrom and Welsh (1960) also indicated higher MMPI scores associated with lower SES.





Theorists have consistently theorized that lower SES groups have unhealthy self-perceptions even though research findings have not supported the theories. This present study is predicting, on the bases of the theories presented, higher HOD scores among the lower SES groups.

### HOD and MMPI

The method of establishing the original pool of items for both the HOD and MMPI was similar. For both tests the items were formulated on the basis of diagnostic interviews, written self-reports and in the case of the HOD, interviews, self-description and retrospect self-description of individuals under the influence of LSD. Having obtained a large pool of items, the responses of psychiatric patients were compared with the responses of a normal sample. Items which seemed to discriminate between psychiatric patients and members from the normal sample were included in the tests (Dahlstrom and Welsh, 1960; and Kelm, Hoffer and Osmond, 1967).

Although the items on the HOD differ from the items of the MMPI, it seems possible that the constructs being measured by the items may be very similar. Therefore, it is hypothesized that a positive relationship should exist between the subscales Paranoia and Depression on the two tests.

Very little research has been done on comparing the HOD with the MMPI. Milner, Kelm and Pringle (unpublished report) administered both the HOD and the MMPI to a group of Indian and White high school students. The results reported a positive significant correlation between the HOD and the schizophrenia scale on the MMPI. Correlation between other subtests was not reported. When the two tests were



correlated with school criteria such as school achievement and behavioral problems in the school, the HOD yielded a more significant relationship. Although it is difficult to make generalizations from this research, a further comparison of the HOD and the MMPI seems warranted.

The Schizophrenia Scale of the MMPI was developed in the same manner as the Paranoia and Depression scales. There have been several reports which indicate that the HOD can differentiate schizophrenic patients from other psychiatric groups (Hoffer and Osmond, 1962; Kelm, Grunberg and Hall, 1965; Kelm and Hoffer, 1965).

The research by Milner, Kelm and Pringle mentioned above indicated a positive correlation between the HOD and the Schizophrenia Scale of the MMPI.

### Hypotheses

Many hypotheses could be suggested from the previous review of relevant literature. The hypotheses to be examined in this research project are enumerated below. It will be recalled that the HOD was so constructed that high scores indicate perceptual distortion (disturbance) and low scores indicate normal perception.

1. There will be a negative correlation between the HOD scores and Intelligence Quotients.

2. The mean HOD scores will decrease with the increase in age. This will be true for both males and females.

3. The HOD scores of the drop-out group will be significantly higher than the HOD scores of the non-drop-out samples.



4. (a) The HOD scores of students who are seeking counselling will be significantly higher than the HOD scores of students who do not seek counselling.

(b) The HOD scores of the students referred to Visiting Psychologists will be significantly higher than students not referred to the Visiting Psychologists.

5. The HOD scores of the underachiever will be significantly higher than the HOD scores of the achiever.

6. The HOD scores of the students with high absentee rates will be significantly higher than the HOD scores of students with low absentee rate.

7. The HOD scores of the lower socio-economic-status subjects will be significantly higher than the HOD scores of the higher socio-economic-status subjects.

8. The scores on the Paranoid Scale and Depression Scale of the HOD will correlate positively with the Paranoia Scale and Depression Scale of the MMPI respectively.

9. The total score on the HOD will correlate positively with the Schizophrenia Scale on the MMPI.

### Method

Included in the discussion of the method used in this particular research will be a discussion of the research design, procedures for collecting the data, instrument and non-instrument data collected, and operational definitions of the important terms used fairly extensively in this thesis.



## Design

The purpose of this study has been stated as the validation of the Hoffer-Osmond Diagnostic Test (HOD) on an adolescent sample. Specifically, construct and concurrent validity of the HOD were investigated in this research (Kerlinger, 1964).

Construct Validity on the HOD was investigated by correlating HOD scores with I.Q. scores, analyzing the relationship between HOD scores and age, analyzing the relationship between HOD scores and socio-economic status, and analyzing the differences between mean HOD scores obtained by criteria groups and control groups. The criteria groups included drop-outs, truants, underachievers, students seeking counseling, and students referred to Visiting Psychologists.

Concurrent Validity on the HOD was established by correlating the scores on the HOD with the scores on the MMPI for the same sample (Hypotheses 8 and 9). Both the HOD and the MMPI are reported to measure similar constructs (Dahlstrom and Welsh, 1960; Kelm, Hoffer, and Osmond, 1967).

## The Sample

There were two samples used in this research. One sample designated as the Large Sample and one sample designated as the Special Sample.

The subjects in the Large Sample were from the grade 10 and 11 students attending Jasper Place Composite High School, Edmonton, Alberta. The students in this school typically represent a cross-section of the population in achievement and socio-economic status.





In order to secure a sample large enough, the students who were taking a grade 10 or 11 English course during the first semester of 1970-71 constituted the sample. Students who were registered as grade 12 students but were taking a grade 11 English course were considered to be grade 11 students in this research. It is assumed that this sample is a random sample because each student has the option to take the compulsory English course in both grades 10 and 11, either in the first or second semester. Table 1 gives an analysis of this sample.

TABLE 1

## ANALYSIS OF LARGE SAMPLE BY GRADE, AGE AND SEX

AGE	MALES	FEMALES	GRADE 10	GRADE 11	TOTAL
14	25	24	47	2	49
15	152	195	293	54	347
16	181	191	63	309	372
17	58	27	9	76	85
18	16	3	0	19	19
19	2	1	0	3	3
TOTAL	434	441	412	463	875

The Special Sample consisted of the students in a Public High School who had been referred to the Visiting School Psychologists for psychological and/or personal reasons but not for educational or



vocational information. It was assumed that the students referred to the Psychologists were the very difficult cases. For this reason, this sample was designated as the Special Sample. The total number of students included in the Special Sample was 29.

### Procedure

The students wrote the HOD during the second and third weeks in December, 1970 and the second and third weeks in January, 1971. The testing was carried out by the researcher in the regular classrooms and during the regular English class periods. After the initial testing, three testing periods were arranged for each class in an attempt to test students who were absent during the regular testing periods.

The students were requested to indicate on their HOD answer sheets if they were presently taking any medication. They were given the option of indicating the type of medication they were taking. After the first two classes had been tested, this procedure was discontinued because of the student's reactions. Some students were sure that the present research was being done in an attempt to find students who were using drugs. Twelve students refused to hand in their answer sheets and other students became very suspicious of the research project. For these reasons, the researcher felt compelled to discontinue asking the students to indicate if they were taking medication.

The Intelligence Quotient (IQ) and father's occupation for each student was obtained from the cumulative records. For the students who did not write the DAT, the most recent IQ was recorded and at no time was an IQ score recorded if the score had been obtained more than three years ago.



The names of the students who wrote the HOD and dropped out between December 1970 and May, 1971 were obtained from the school records. The names of the students who sought counselling, and the number of times they came for counselling were obtained from the counselling office. The age, sex, grade, school marks, and number of class periods absent from school were available from the current report cards.

The HOD was administered to the students in the Special Sample by the Visiting Psychologists. All the other information on the Special Sample was obtained by the researcher from the school records.

The members of the various control groups who were compared with the members of the various criteria groups were all selected from the Large Sample using a list of random numbers.

### Instruments

Hoffer-Osmond Diagnostic Test (HOD). The HOD was administered to all the subjects in the Large Sample and Special Sample. A detailed description of the HOD has already been presented in Chapter III and will not be reported here.

The four HOD scores used in this research were Total Score (TS), Perceptual Score (PerS), Paranoid Score (PS), and Depression Score (DS). Since the purpose of this study was not to determine the extent to which HOD scores discriminate schizophrenics from non-schizophrenics, the Ratio Score (RS) and Short Form (SF) were not considered in this study. Furthermore, since the validity of a test is related to the reliability of the test, and the reliability of a test is related to the number of items in the test, all the items on the HOD were considered





and the validation of the SF, which is an abbreviated form of the HOD, was not included in this research project (Anastasi, 1968).

Intelligence Measure. The Differential Aptitude Test (DAT) was administered to the grade 10 classes by the school counsellors in the Fall of 1970 as a part of the testing program in the school.

The DAT was constructed to assist in vocational and educational counselling. The complete DAT yields eight scores: Verbal Reasoning, Numerical Ability, Abstract Reasoning, Clerical Speed and Accuracy, Mechanical Reasoning, Space Relations, Language Usage I - Spelling, and Language Usage II - Grammar. Generally, verbal tests correlate highly with English courses and numerical tests correlate with the Mathematics courses. This is the reason that Verbal Reasoning plus Numerical Ability (VR+NA) was introduced as an index of scholastic aptitude (Anastasi, 1968).

The intelligence measure for the grade 11 students and 47 grade 10 students who did not take the DAT was obtained from the students' cumulative folders. Nearly all of these students had an intelligence quotient which had been obtained from the Henmon-Nelson Intelligence Test (HN) or the Lorge Thorndike Intelligence Test (LT). All the items on the Henmon-Nelson Intelligence Test are used to obtain a composite intelligence quotient. The Lorge Thorndike Intelligence Test has a verbal and a non-verbal test. Since the verbal scores are better predictors of academic achievement than non-verbal scores, the verbal test of the LT was used as a measure of intelligence (Anastasi, 1968).

The correlation coefficient of the DAT (VR+NA) and English for grade 10 boys ranged from .34 to .65 and for grade 10 girls .32 to .68.



The correlation coefficient of the DAT (VR+NA) and Mathematics for grade 10 students is reported as .40 for boys and .30 for girls (Bennett, Seashore and Wesman, 1966). The odd-even reliability coefficient of the DAT (VR+NA) for grade 10 students is reported as .95 for the boys and .96 for the girls.

The correlation between the DAT (VR+NA) and Henmon-Nelson Intelligence Test for high school boys is reported as .78 and for high school girls .79. The correlation between the LT (Verbal) and DAT (VR+NA) for high school students is reported as .75 for boys and .79 for girls (Bennett, Seashore and Wesman, 1966).

The odd-even reliability coefficient for the HN is reported as .93 for grade 10 students and .93 for grade 11 students. The odd-even reliability of the LT is reported to be .94 for the verbal (Lorge and Thorndike, 1957).

In Table 2 a summary is presented of the intelligence measures of the Large Sample by grade, test and sex.

TABLE 2

## INTELLIGENCE MEASURES OBTAINED BY GRADE, TEST AND SEX

GRADE	TEST	MALE	FEMALE
10	DAT	173	191
10	HN/LT	25	22
11	HN/LT	212	222
10 & 11	no score	20	10



The intelligence measure of the Special Sample was not used in the analysis because the recorded IQ's for these students were based upon so many different intelligence tests - some individual intelligence tests and some group intelligence tests.

Achievement Measure. The underachieving students were identified by comparing each student's aggregate achievement score with his recorded IQ score.

The final achievement scores from the first semester were normalized and standard score equivalents calculated. The achievement scores reported by the teachers were used rather than standardized test scores because it was assumed that school marks are sensitive to the student's current performance, while standardized test scores reflect students' total background (Zingle, 1965).

The DAT scores were recorded in standard score form with a mean of 50 and a standard deviation of 10. The IQ scores reported for the students who did not write the DAT were transformed to standard scores with a mean of 50 and a standard deviation of 10.

The underachieving student was identified as a student whose T score for achievement was 13 or more points below his T score for intelligence quotient (Zingle, 1965). As a result of this procedure, 98 underachievers were identified. Of the 98 underachievers, 45 were females and 53 were males.

Socio-Economic Status Classification. The socio-economic status (SES) rating used was the Occupational Class Scale by Blishen (1961). This scale was developed using Canadian census data of 1951 and is an occupational ranking which takes into consideration educational training and level of income. Each occupation is given a rank.





The combining of standard scores for income and standard scores for years of schooling resulted in 343 occupation ranks. These occupation ranks were divided into seven classes. The class divisions were arbitrarily selected. The results of this arbitrary selection was that the number of occupational ranks in each class are not equal. The selection of arbitrary class intervals, however, was necessary to ensure that occupations in any particular class would be similar with respect to income and years of schooling (Blishen, 1961).

The extent to which the Blishen Occupational Scale reflects the prestige ranking of the occupations was studied by comparing the Blishen Scale with a study on the prestige of occupations by Tuckman in 1947 (Blishen, 1961). The rank correlation between the Blishen Scale and the prestige of occupation obtained by Tuckman was .91.

By comparing the Blishen Scale with occupation prestige scales of other countries such as United States, Great Britain, New Zealand, Japan, and Germany, rank correlations of .94, .85, .89, .90, and .74, respectively, have been obtained.

The Blishen Scale was selected for the present study because of the large number of occupations included in the scale which would reduce the amount of value-judgment involved in classifying occupations.

At times it was difficult to determine the appropriate rank for some of the occupations stated. One such occupation was "manager". By further investigation through other school records, asking teachers and students, and/or phoning the home, a more accurate occupation was obtained. In a few instances where the father was deceased, it was impossible to establish the father's occupation. Some students reported being wards





of the government, in which case it was not possible to get the father's occupation. Table 3 gives an analysis of the number of students in each SES rank.

TABLE 3

NUMBER OF STUDENTS PER SES GROUP, PERCENTAGE OF STUDENTS PER SES GROUP, PERCENTAGE OF PEOPLE PER SES REPORTED BY BLISHEN

SES GROUP	NUMBER	% OF SAMPLE	% OF BLISHEN (1957)
1	22	2.56	0.9
2	229	26.66	10.7
3	108	12.57	6.3
4	54	6.29	7.0
5	276	32.13	34.2
6	137	15.95	19.6
7	33	3.84	21.3
TOTAL	859	100.00	100.0

In the present research, the differences in the percent of students classified in each group and the percent of the total population in each group given by Blishen is probably due to the declining proportions of the labor force employed as skilled workers (Blishen, 1965). This would result in larger proportions of the labor force in the higher SES classes. Blishen (1951) compared the occupational



structure from 1901 to 1951 and found a trend toward lower proportion of the labor force in semi-skilled occupations.

Personality Measure. The Minnesota Multiphasic Personality Inventory (MMPI) was administered to a random sample of 60 students in order to establish the concurrent validity of the HOD.

The MMPI was designed to measure objectively the personality characteristics which affect personal and social adjustment (Dahlstrom and Welsh, 1960). The MMPI has nine basic clinical scales. They are: Hypochondriasis (Hs), Depression (D), Hysteria (Hy), Psychopathic deviate (Pd), Masculinity-femininity (Mf), Paranoia (Pa), Psychosthenia (Pt), Schizophrenia (Sc), and Hypomania (Ma).

Although the labels given to the nine basic clinical scales would suggest that it is a test of mental illness, research has shown that the scales have definite meaning within the normal range of behavior (Dahlstrom and Welsh, 1960). Research has also indicated that the reading level of the MMPI is at approximately the sixth grade level. Because of these two research findings and because of the clinical scales, the MMPI was selected to test the concurrent validity of the HOD.

For this research, only the three scales - paranoia, depression and schizophrenia were considered. These three scales are reported to measure the same constructs as the paranoid, depression and total score of the HOD respectively.

The MMPI has four validity scales built into the test. A ? Scale which is a total number of the items omitted or answered "cannot say", an L Scale which is a total of the items which tend to place the testee in good social and moral perspective, an F Scale which consists



of the items that would tend to make the individual appear more unhealthy than would be expected, and a K Scale which reveals extreme facades of adequacy and freedom from personal defects. A test protocol with a score of 70 on either the ? Scale or L Scale, a score of 80 on the F Scale and/or a score of 25 on the K Scale is considered too high for conventional interpretations.

The test-retest reliability on a high school sample with an interval of four years between the test-retest situation yielded a reliability coefficient for boys of .14 on the depression scale, .20 on the paranoid scale and .13 on the schizophrenic scale. The equivalent reliability coefficient for the girls were .51, .50 and .60 respectively (Dahlstrom and Welsh, 1960).

Prior to writing the MMPI, the parents of each of the students selected to write the test were informed by letter that their child had been selected to write the MMPI. See Appendix B for a copy of the letter. Of the 60 students selected, three did not complete the test, three students were dropped from the sample at the request of their parents and another three students did not appear for any of the four testing periods. This left a sample of 51. Table 4 gives an analysis of this sample.

TABLE 4

## ANALYSIS OF MMPI SAMPLE - GRADE AND SEX

GRADE	FEMALE	MALE	TOTAL
10	16	12	28
11	12	11	23
TOTAL	38	23	51





### Non-Instrument Data

Drop-Out. For every student who drops out of school prior to completing the program in which he is registered, a record is kept in the school. From these records it was possible to determine the members of the drop-out group.

Self-Referral. A record is kept in the counselling office of every student who seeks counselling. Also, the number of times an individual came for counselling is recorded. These records provided the necessary information to investigate the relationship between HOD scores on students who sought counselling and a control sample of students.

Absenteeism. The teachers record the number of class periods each student is absent from school. The number of class periods each student is absent is then reported to his parents on each report card. The rate of absenteeism for each student in the present study was obtained from the student report cards.

### Operational Definitions

The following terms have been used fairly extensively in the context of the development of the hypotheses earlier in this chapter. They are now given as operational definitions within the context of this present study.

Intelligence. This term will have two meanings throughout this study. On the one hand, it will mean the T scores obtained by the student who wrote the DAT. On the other hand, it will mean the most recent intelligence quotient recorded in the student's cumulative folder.



Drop-Out. This term is used to refer to any student who officially withdrew from school prior to the completion of the program in which he was registered. Students who transferred to other schools are not designated as drop-outs.

Referral Agencies. This term includes school psychologists and social workers or any other agency, outside the school, to whom students are referred for various reasons.

Underachiever. This is operationally defined as a student whose T score for aggregate achievement is 13 or more points lower than the T score for intelligence.

Achiever. This is operationally defined as a student whose T score for aggregate achievement and T score for intelligence differ by less than 13 points.

Absentee rate. This term refers to the accumulative number of school periods a student was absent from school. High absentee rate refers to the 31% who had been absent 30 or more periods in the first semester. Low absentee rate refers approximately to the bottom 30% who had been absent nine or fewer periods during the first semester.

Socio-Economic Status. This term is defined as the rank accorded the father's occupation according to Blishen's ranking scale.

Perceptual Distortion. This term, in this research, refers to HOD scores.

Large Sample. The Large Sample consists of all the students attending Jasper Place Composite High School, Edmonton, Alberta, who wrote the HOD.

Special Sample. The Special Sample consists of all the students referred to the Visiting Psychologists who wrote the HOD.



Seekers of Counselling. This term is used to refer to any student who visited the school counsellor three or more times from September, 1970 to May, 1971.

Control Groups. This term refers to groups of students randomly selected from the Large Sample. The HOD scores obtained by the control groups were compared with the HOD scores obtained by the criteria groups in investigating the construct validity of the HOD.

### Analysis of Data

The data collected on each student were entered on IBM data cards. Subsequently, computer calculations were made consisting largely of correlations, analysis of variance and analysis of covariance. The specific statistical analysis used to test each of the hypotheses and the results from each of the analyses are presented in Chapter V.



## CHAPTER V

### RESULTS

The results of the statistical analysis performed for each hypothesis are presented in the same sequence as the hypotheses were developed in Chapter III. Hypotheses 1 to 7 were designed to investigate the construct validity on the HOD and Hypotheses 8 and 9 were designed to investigate the concurrent validity on the HOD.

#### HOD and Intelligence

In Hypothesis 1, negative correlations between the four HOD scores and Intelligence test scores were predicted. Since the Intelligence Quotient scores (IQ) on the subjects of the Large Sample were obtained from different intelligence tests, the subjects who wrote the DAT were analyzed separately from the subjects who did not write the DAT. The correlations between the four HOD scores and DAT scores are presented in Table 5. As predicted, these correlation coefficients are all negative. The correlation coefficient between the Total Score and IQ and Paranoid Score and IQ were significant at the .01 level of significance while the correlation coefficient between the Perceptual Score and IQ and Depression Score and IQ were significant at the .05 level of significance.

The correlation coefficient between the four HOD scores and IQ scores for the students who did not write the DAT are presented in Table 6. Only the correlation coefficient between the Paranoid Score





and the IQ score was negative, but, this correlation did not reach the .05 level of significance.

It is important to remember when considering these findings that the Intelligence Quotients from the DAT were obtained within a two-month period prior to the writing of the HOD. The Intelligence Quotients of the other students were obtained within a period of one to three years prior to the writing of the HOD.

Hypothesis 1 is confirmed on the subjects who wrote the DAT, but not confirmed on the subjects who did not write the DAT.

TABLE 5

CORRELATION BETWEEN TOTAL SCORE ON THE HOD, THREE SUB-SCORES  
ON THE HOD AND INTELLIGENCE QUOTIENT (DAT GROUP); LEVEL  
OF SIGNIFICANCE OF EACH CORRELATION

VARIABLES	IQ ( N=363)	SIGNIFICANCE
TOTAL SCORE	-0.137	0.01
PERCEPTUAL SCORE	-0.101	0.05
PARANOID SCORE	-0.173	0.01*
DEPRESSION SCORE	-0.111	0.03

\* Actual level of significance was 0.0008



TABLE 6

CORRELATION BETWEEN TOTAL SCORE ON THE HOD, THREE SUB-SCORES  
ON THE HOD AND INTELLIGENCE QUOTIENT (OTHER TEST GROUP);  
LEVEL OF SIGNIFICANCE OF EACH CORRELATION

VARIABLES	IQ (N=481)	SIGNIFICANCE
TOTAL SCORE	0.008	0.86
PERCEPTUAL SCORE	0.010	0.81
PARANOID SCORE	-0.069	0.13
DEPRESSION SCORE	0.012	0.79

HOD and Age by Sex

Based on the theoretical rationale and the related research previously outlined, the prediction was made that females would obtain higher scores on the HOD than males. It was also predicted that the mean scores on the HOD of the various age groups would decrease with the increase in age. A two-way analysis of variance was performed on the HOD scores of the total sample. A summary of this analysis is given in Table 7. From Table 7 it is obvious that the HOD scores discriminated between males and females. The mean scores in Table 8 indicate that with two exceptions, the females had consistently higher mean scores than the males. The two exceptions are the Paranoid Score of the 17-year-old subjects, and the Depression Score of the 18-year-old subjects where the males obtained higher mean scores than the females.



TABLE 7

TWO-WAY ANALYSIS OF VARIANCE (AGE BY SEX) OF TOTAL SAMPLE  
ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	AGE	4	2284.45	2.08	.08
	SEX	1	2471.14	22.47	< .01
	ERROR	869	1099.81		
PerS	AGE	4	114.70	1.55	.19
	SEX	1	1662.25	22.39	< .01
	ERROR	869	74.23		
PS	AGE	4	50.45	3.42	< .01
	SEX	1	74.55	5.06	< .02
	ERROR	869	14.74		
DS	AGE	4	36.29	2.47	< .04
	SEX	1	488.72	33.25	< .01
	ERROR	869	14.70		





TABLE 8

MEANS AND STANDARD DEVIATIONS OF MALES AND FEMALES BY AGE OF TOTAL  
GROUP ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	AGE*	MALE $\bar{X}$	FEMALE $\bar{X}$	MALE SD	FEMALE SD
TS	14	41.60	48.79	23.67	30.11
	15	46.99	60.21	33.53	31.28
	16	45.65	53.81	36.07	32.36
	17	52.50	65.07	32.69	41.70
	18	47.89	73.25	28.15	48.47
PerS	14	9.20	11.13	6.56	8.41
	15	10.31	13.42	8.22	8.13
	16	9.94	12.35	8.86	9.22
	17	11.72	15.15	8.68	10.53
	18	9.50	15.00	7.59	10.65
PS	14	2.88	3.50	2.45	2.30
	15	2.98	4.02	2.59	2.68
	16	3.11	3.58	2.74	2.57
	17	5.26	4.15	11.17	2.85
	18	3.11	5.25	2.19	3.77
DS	14	4.36	5.29	2.63	3.33
	15	5.11	6.83	3.59	3.82
	16	4.92	6.48	3.94	4.05
	17	6.02	7.04	3.91	4.17
	18	6.61	6.50	3.70	5.45

\* The number of students per age group is as follows: 14 year olds = 25 males and 24 females; 15 year olds = 152 males and 195 females; 16 year olds = 181 males and 191 females; 17 year olds = 58 males and 27 females; 18 year olds = 18 males and 4 females.



The results of the analysis of variance of the mean HOD scores of the five age groups is also presented in Table 7. The F value of the Paranoid Score and Depression Score discriminated between age groups of the .01 and .04 level of significance respectively. The Scheffe test of the mean scores (Table 9) indicates that the 17-year-old subjects were significantly different from the 15-year-old and 16-year-old subjects on the Paranoid Score only. All the other comparisons of means failed to reach the .05 level of significance. Tables 10 and 11 contain the summaries of the Scheffe comparisons of means of the males and females respectively. On the Paranoia Score the 17-year-old males differed from the 15-year-old males and 16-year-old males at the .05 and .06 levels of significance respectively. All the other comparisons of the means obtained by the males failed to reach the .05 level of significance. All the comparisons of the means obtained by the females failed to reach the .05 level of significance.

From this analysis, it seems fair to conclude that the 17-year-old males account for most of the variance obtained among the five groups considered in this study.

Hypothesis 2 is confirmed with respect to the sex variable. Hypothesis 2 is not confirmed with respect to the age variable, even though from the analysis of variance (Table 7) it would appear that the Paranoid Score and Depression Score of the HOD discriminate among the 14 to 18 age groups.



TABLE 9

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISONS OF MEANS OF TOTAL  
SAMPLE BY AGE GROUPS ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	AGE	14	15	16	17	18
TOTAL SCORE	14	1.00				
	15	.59	1.00			
	16	.94	.61	1.00		
	17	.30	.85	.31	1.00	
	18	.81	.99	.95	.99	1.00
PERCEPTUAL SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.79	1.00			
	16	.97	.85	1.00		
	17	.39	.76	.36	1.00	
	18	.99	.99	.99	.93	1.00
PARANOID SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.99	1.00			
	16	.99	.98	1.00		
	17	.13	< .04	< .01	1.00	
	18	.99	.99	.99	.72	1.00
DEPRESSION SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.43	1.00			
	16	.69	.92	1.00		
	17	.15	.76	.42	1.00	
	18	.27	.80	.62	.99	1.00



TABLE 10

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISONS OF MALE AGE  
GROUP MEANS ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	AGE	14	15	16	17	18
TOTAL SCORE	14	1.00				
	15	.97	1.00			
	16	.99	.99	1.00		
	17	.77	.89	.77	1.00	
	18	.99	1.00	.99	.99	1.00
PERCEPTUAL SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.98	1.00			
	16	.99	.99	1.00		
	17	.82	.88	.74	1.00	
	18	1.00	.99	.99	.92	1.00
PARANOID SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	1.00	1.00			
	16	.99	.99	1.00		
	17	.36	< .05	.06	1.00	
	18	.99	1.00	1.00	.60	1.00
DEPRESSION SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.93	1.00			
	16	.97	.99	1.00		
	17	.49	.65	.44	1.00	
	18	.44	.63	.51	.99	1.00





TABLE 11

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISONS OF FEMALE AGE  
GROUP MEANS ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	AGE	14	15	16	17	18
TOTAL SCORE	14	1.00				
	15	.62	1.00			
	16	.97	.44	1.00		
	17	.53	.97	.59	1.00	
	18	.75	.96	.84	.99	1.00
PERCEPTUAL SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.83	1.00			
	16	.98	.84	1.00		
	17	.62	.92	.66	1.00	
	18	.96	.99	.99	1.00	1.00
PARANOID SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.94	1.00			
	16	1.00	.61	1.00		
	17	.94	1.00	.89	1.00	
	18	.82	.93	.81	.96	1.00
DEPRESSION SCORE	AGE	14	15	16	17	18
	14	1.00				
	15	.51	1.00			
	16	.74	.94	1.00		
	17	.64	.99	.98	1.00	
	18	.99	.99	1.00	.99	1.00



HOD and Drop-Outs

Based on the theoretical rationale and the related research previously outlined, differences were hypothesized between students who drop out of school and students who remain at school. Specifically, it was hypothesized that students who drop out are more disturbed than students who remain in school. In Table 12 are summarized the means and standard deviations of the drop-out group and a control group. The mean scores obtained by the drop-out group on the four HOD scores were higher than the mean scores obtained by the control group (Table 12).

TABLE 12  
MEANS AND STANDARD DEVIATIONS OF DROP-OUTS AND CONTROL  
GROUP ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	GROUPS	N	$\bar{X}$	SD
TS	DROP-OUT	37	62.95	39.40
	CONTROL	37	58.19	32.50
PerS	DROP-OUT	37	13.78	10.15
	CONTROL	37	13.56	8.80
PS	DROP-OUT	37	3.89	2.88
	CONTROL	37	3.46	2.42
DS	DROP-OUT	37	7.46	4.43
	CONTROL	37	6.22	3.65



An analysis of covariance was performed on the mean scores of the drop-out group and the control group where age and IQ were the covariates and sex differences were controlled by having the same number of males and females in the control group as there were in the drop-out group. A summary of the analysis of covariance is presented in Table 13.

TABLE 13

ANALYSIS OF COVARIANCE OF DROP-OUT AND CONTROL GROUP  
ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUP	1	238.81	.19	0.67
	WITHIN	70	1282.01		
PerS	GROUP	1	1.10	1.25	0.91
	WITHIN	70	87.95		
PS	GROUP	1	3.31	.47	0.50
	WITHIN	70	7.12		
DS	GROUP	1	16.90	1.08	0.30
	WITHIN	70	15.60		

From the evidence presented above it is obvious that the drop-out group did not differ significantly from the control group on the HOD. Thus Hypothesis 3 is not confirmed.





### HOD and Self-Referrals to Counsellors

In Hypothesis 4(a) it was predicted that students seeking counselling (seekers) would exhibit higher HOD scores than would the students in the control group who did not seek counselling. The mean scores obtained by the seekers of counselling on the Total Score and three sub-scores on the HOD were higher than the mean scores obtained by the control group. The means and standard deviations of the two groups appear in Table 14.

TABLE 14

MEANS AND STANDARD DEVIATIONS OF STUDENTS SEEKING COUNSELLING  
(SEEKERS) AND CONTROL SAMPLE ON TOTAL SCORE AND THREE  
SUB-SCORES ON THE HOD

VARIABLE	GROUP	N	$\bar{X}$	SD
TS	SEEKERS	64	74.55	49.42
	CONTROL	64	58.39	35.35
PerS	SEEKERS	64	16.03	12.19
	CONTROL	64	13.53	9.54
PS	SEEKERS	64	4.77	3.74
	CONTROL	64	3.89	2.48
DS	SEEKERS	64	8.25	4.68
	CONTROL	64	6.06	4.10



An analysis of covariance was performed on the mean scores of the seekers of counselling and the control group with age, IQ and sex being the covariates. The results of this analysis, which are summarized in Table 15, indicate that the students seeking counselling had significantly higher mean scores than the control group on the Total Score and Depression Score of the HOD. The mean Paranoid Scores and mean Perceptual Scores were not significantly different between the two groups. Hypothesis 4(a) is thus confirmed on the Total Score and Depression Score of the HOD.

TABLE 15

ANALYSIS OF COVARIANCE OF STUDENTS SEEKING COUNSELLING (SEEKERS) AND CONTROL SAMPLE ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUP	1	8130.50	4.35	< 0.04
	WITHIN	124	1870.55		
PerS	GROUP	1	190.76	1.57	0.21
	WITHIN	124	121.35		
PS	GROUP	1	32.15	3.20	0.08
	WITHIN	124	10.05		
DS	GROUP	1	119.89	6.17	< 0.01
	WITHIN	124	19.44		



### HOD and Special Sample

Hypothesis 4(b) contained the prediction that the HOD scores obtained by the students in the Special Sample would be higher than the HOD scores of the students of a control group. The mean age of the two groups as well as the number of males and females in each of the groups were not significantly different. Because the recorded IQ scores of the students in the Special Sample were obtained from a variety of intelligence tests, the intelligence variable could not be controlled in the analysis of these two groups. Table 16 contains the means and standard deviations of the two groups. See also Appendix C for a graph of the Total Scores obtained by the students in these two groups.

TABLE 16

MEANS AND STANDARD DEVIATIONS FOR SPECIAL SAMPLE AND CONTROL  
SAMPLE ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

GROUPS		TS	PerS	PS	DS
SPECIAL	$\bar{X}$	78.28	16.72	5.90	9.17
	SD	48.56	12.19	3.24	5.08
CONTROL	$\bar{X}$	41.21	9.52	2.97	4.86
	SD	25.69	6.86	2.29	3.23



TABLE 17

ANALYSIS OF VARIANCE OF SPECIAL SAMPLE AND CONTROL SAMPLE  
ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUPS	1	19924.50	13.20	$< 0.0006$
	ERROR	56	1509.23		
PerS	GROUPS	1	753.12	7.70	$< 0.0074$
	ERROR	56	97.77		
PS	GROUPS	1	124.57	15.79	$< 0.0002$
	ERROR	56	7.89		
DS	GROUPS	1	269.40	14.88	$< 0.0002$
	ERROR	56	18.10		

From the summary of the analysis presented in Table 17, it is obvious that Hypothesis 4(b) is confirmed. The Special Sample obtained significantly higher mean scores on all four HOD scores than the control sample.

#### HOD and Underachievers

To test Hypothesis 5, an analysis of covariance was performed on the mean scores obtained by the underachieving group and a control group on the Total Score and three sub-scores on the HOD. Table 18 contains a summary of the means and standard deviations of the two groups. The mean scores of the underachieving group are higher than the mean scores





for the control group on the Total Score, Perceptual Score and Depression Score. On the other hand, the mean score for the control group is larger than the mean score of the underachieving group on the Paranoid Score.

TABLE 18

MEANS AND STANDARD DEVIATIONS OF UNDERACHIEVERS AND A CONTROL  
SAMPLE ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	GROUP	N	$\bar{X}$	SD
TS	UNDERACHIEVER	98	58.66	36.97
	CONTROL	98	48.73	27.93
PerS	UNDERACHIEVER	98	12.97	9.67
	CONTROL	98	10.64	7.15
PS	UNDERACHIEVER	98	3.50	2.80
	CONTROL	98	3.81	6.65
DS	UNDERACHIEVER	98	6.95	4.00
	CONTROL	98	5.61	3.67

The analysis of covariance was performed on the mean scores of the two groups. Table 19 provides the summary of this analysis. Age and IQ were the covariates and the sex variable was controlled by having equal numbers of males and females in the two groups. The underachieving group obtained mean scores which were significantly different from the mean scores obtained by the control group on the Total Score and



TABLE 19

ANALYSIS OF COVARIANCE OF UNDERACHIEVERS AND CONTROL SAMPLE  
ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUP	1	5002.31	4.65	< 0.03
	WITHIN	192	1076.55		
PerS	GROUP	1	264.85	3.63	0.06
	WITHIN	192	73.01		
PS	GROUP	1	.10	38.98	0.95
	WITHIN	192	26.05		
DS	GROUP	1	105.85	7.19	< 0.01
	WITHIN	192	14.72		

Depression Score. The mean scores of the two groups on the Perceptual Score and Paranoid Score were not significantly different, although the F value on the Perceptual Score is very close to being significant. Hypothesis 5 is confirmed for the Total Score and Depression Score but not for the Perceptual Score and Paranoid Score.

#### HOD and Absenteeism

Hypothesis 6 was designed to measure the relationship between scores on the HOD and absenteeism. The students with a high rate of absenteeism (30 periods absent) were compared with the students with a low rate of absenteeism (less than 10 periods absent). The means and



standard deviation of the two groups on the Total Score and three sub-scores of the HOD are summarized in Table 20.

TABLE 20

MEANS AND STANDARD DEVIATIONS OF STUDENTS WITH HIGH  
ABSENTEE RATE AND LOW ABSENTEE RATE ON TOTAL SCORE  
AND THREE SUB-SCORES ON THE HOD

VARIABLE	GROUPS	N	$\bar{X}$	SD
TS	HIGH	268	58.25	40.77
	LOW	229	44.95	26.56
PerS	HIGH	268	13.06	10.71
	LOW	229	9.97	6.79
PS	HIGH	268	3.72	2.88
	LOW	229	3.00	2.35
DS	HIGH	268	6.50	4.26
	LOW	229	5.01	3.40

An analysis of covariance was performed on the mean scores of the two groups. Age and IQ were the two covariates. The number of males and females in the two groups were not significantly different. The results of the analysis are summarized in Table 21. The results indicate that the students with a high rate of absenteeism had signifi-





cantly larger mean scores than the students with a low rate of absenteeism on the Total Score and the three sub-scores on the HOD.

TABLE 21

ANALYSIS OF COVARIANCE OF STUDENTS WITH HIGH ABSENTEE RATE  
AND STUDENTS WITH LOW ABSENTEE RATE ON TOTAL SCORE  
AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUPS	1	19904.19	16.33	< 0.01
	WITHIN	495	1218.92		
PerS	GROUPS	1	1131.96	13.64	< 0.01
	WITHIN	495	82.99		
PS	GROUPS	1	46.55	6.69	< 0.01
	WITHIN	495	6.96		
DS	GROUPS	1	234.86	15.52	< 0.01
	WITHIN	495	15.13		

#### HOD and Socio-Economic Status

Hypothesis 7 contained the prediction of higher HOD scores for students in the lower SES Class than for students in the higher SES Class. Prior to analyzing the data for this hypothesis, the seven SES groups according to the Occupation Class Scale by Blishen (1961) were regrouped into four SES Classes in the following way: Classes 1 and 2



became Class 1, Classes 3 and 4 became Class 2, Class 5 became Class 3, and Classes 6 and 7 became Class 4. This regrouping was done in order to have a more comparable number of students in each of the SES Classes. Table 22 provides a summary of the means and standard deviations for SES Classes on the Total Score and three sub-scores on the HOD. The mean scores tend to increase with a decrease in SES. From Table 23, however, it is clear that the mean scores of Class 4 and Class 1 on the Total Score of the HOD and the mean scores of Class 4 and Class 1 on the Depression Score are significantly different. All the other mean scores are not significantly different. The mean scores of Class 4 and Class 1 on the Perceptual Score are close to attaining a significant difference.

TABLE 22

MEANS AND STANDARD DEVIATIONS OF FOUR SOCIO-ECONOMIC STATUS  
GROUPS ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLES	GROUPS	N	$\bar{X}$	SD
TS	1	247	49.23	31.05
	2	160	51.74	35.25
	3	268	50.43	34.00
	4	160	58.68	33.72
PerS	1	247	11.03	8.31
	2	160	11.31	8.98
	3	268	11.25	8.95
	4	160	13.39	8.67
PS	1	247	3.36	2.46
	2	160	3.28	2.73
	3	268	3.59	4.59
	4	160	3.72	2.66
DS	1	247	5.57	3.94
	2	160	5.66	3.87
	3	268	5.83	3.83
	4	160	6.69	3.98



TABLE 23

PROBABILITY MATRIX FOR SCHEFFE MULTIPLE COMPARISON OF MEANS  
OF FOUR SOCIO-ECONOMIC STATUS GROUPS ON TOTAL SCORE  
AND THREE SUB-SCORES ON THE HOD

VARIABLE	GROUPS	1	2	3	4
TS	1	1.00			
	2	0.91	1.00		
	3	0.98	0.98	1.00	
	4	< 0.05	0.33	0.11	1.00
PerS	1	1.00			
	2	0.99	1.00		
	3	0.99	0.99	1.00	
	4	0.06	0.21	0.11	1.00
PS	1	1.00			
	2	0.99	1.00		
	3	0.91	0.84	1.00	
	4	0.77	0.71	0.98	1.00
DS	1	1.00			
	2	0.99	1.00		
	3	0.91	0.98	1.00	
	4	< 0.05	0.13	0.18	1.00

An analysis of covariance was performed on the mean scores obtained by the four SES Classes on the four HOD scores. Age and IQ were the covariates. The proportion of males and females in each of the four SES Classes was not significantly different, therefore, the sex variable was also controlled in this analysis. From Table 24 it appears that the four SES Classes obtained significantly different mean scores on the HOD. However, from Table 23 it appears that Class 4 mean scores



only, were significantly different from Class 1 mean scores. Hypothesis 7 is therefore confirmed on Classes 4 and 1 for the Total Score, Perceptual Score and Depression Score. The Paranoid Score did not discriminate significantly between SES Classes.

TABLE 24

ANALYSIS OF COVARIANCE OF FOUR SOCIO-ECONOMIC STATUS GROUPS  
ON TOTAL SCORE AND THREE SUB-SCORES ON THE HOD

VARIABLE	SOURCE	df	MS	F	P
TS	GROUPS	3	3226.92	2.91	$< 0.03$
	WITHIN	828	1108.15		
PerS	GROUPS	3	218.84	2.88	$< 0.04$
	WITHIN	828	75.87		
PS	GROUPS	3	4.59	.41	0.75
	WITHIN	828	11.27		
DS	GROUPS	3	43.68	2.87	$< 0.04$
	WITHIN	828	15.24		

#### HOD and MMPI

In Hypotheses 8 and 9 the prediction was made that the Total Score, Paranoid Score and Depression Score on the HOD would correlate positively with the Schizophrenia Score, Paranoia Score and Depression





Score on the MMPI. A random sample of 51 students who had already written the HOD wrote the MMPI.

A Pearson-Product-Moment Correlation was performed on the mean scores. The correlations are summarized in Table 25. As predicted, the scores obtained on the corresponding scales of the HOD and MMPI correlate positively. The correlation coefficients are statistically significant at the .01 level of significance. Hypotheses 8 and 9 are therefore confirmed.

TABLE 25

## CORRELATIONS BETWEEN HOD SCORES AND MMPI SCORES

## AND INTERCORRELATION AMONG THE SCORES

SCALES	TS	PS	DS	Sc	Pa	D
TS (HOD)	1.000					
PS (HOD)	.827***	1.000				
DS (HOD)	.801***	.623***	1.000			
Sc (MMPI)	.554***	.449***	.458***	1.000		
Pa (MMPI)	.523***	.375**	.519***	.794***	1.000	
D (MMPI)	.257	.119	.371***	.481***	.530***	1.000

\*\* significant at .01 level

\*\*\* significant at .001 level



### Summary

The conclusions possible on the basis of results presented in this chapter are:

- a. The HOD scores correlate negatively with DAT scores, but not with the Henmon-Nelson and/or Lorge Thorndike scores.
- b. Females tend to have higher HOD scores than males.
- c. HOD scores tend to vary with age, although no consistent relationship was obtained in this research.
- d. There is no difference between the HOD scores of students who drop out of school and students who do not drop out of school.
- e. Students who sought counselling obtained higher Total Scores and Depression Scores on the HOD than students who did not seek counselling. There was no difference between the Perceptual Score and Paranoid Score of the student who sought counselling and the student who did not seek counselling.
- f. Students referred to the Visiting Psychologists obtained higher scores on the HOD than students not referred to the Visiting Psychologists.
- g. Underachieving students obtained higher Total Scores, and Depression Scores than students who were achieving. There was no difference between the Paranoid Scores of underachieving and achieving students.
- h. Students with a high rate of absenteeism obtained higher scores on the HOD than students with a low rate of absenteeism.
- i. Students from the lower socio-economic status obtained higher Total Scores, Perceptual Scores and Depression Scores than



students in the upper socio-economic status. There was no difference between the Paranoid Score obtained from students in the various socio-economic status groups.

j. The Total Score, Paranoid Score and Depression Score on the HOD correlate positively with the Schizophrenia Score, Paranoia Score and Depression Score on the MMPI respectively.





## CHAPTER VI

### DISCUSSION AND IMPLICATIONS

The discussion in this chapter will consider an evaluation of the HOD as a tool to be used by school counsellors, the relationship between the HOD and the Perceptual Theory of Behavior and a possible explanation for the predictions which were not confirmed in this research. The implications from the findings of this research will be suggested as each hypothesis is considered. Implications for further research will also be presented in this Chapter.

#### HOD on Adolescence

It has been shown in this research that the scores which students obtained on the HOD were related to some of the school problems considered in this research. The Total Score, Perceptual Score and Depression Score discriminated significantly between most of the criteria groups and control groups. The Paranoid Score did not discriminate as well as the other three Scores and will be discussed later in this Chapter.

It would appear that the HOD may be a valuable tool for school counsellors. Using the cut-off scores suggested by Kelm, Hoffer and Osmond (1966), a counsellor could select many of the students who have perceptual distortions and begin counselling these students. Since it takes students approximately 40 minutes to write the HOD, it would be advisable to have the total school population write the HOD. In this way the counsellors could also become aware of students who have a lot of per-



ceptual distortion but have not been identified as having a behavioral problem. Through a medical referral (Pauling, 1968) and counselling, it seems possible that many of these students could be helped before a behavioral problem arises.

The sub-scores, with the exception of the Paranoid Score because of its poor discrimination between criteria groups and control groups, need to be considered as well as the Total Score. Appendix D contains a summary of the intercorrelation between the four scores on the HOD. The Perceptual Score correlates fairly highly with the Total Score. The correlation coefficients between the Total Score and Paranoid Score and the Total Score and Depression Score are low enough to suggest that the Total Score, Paranoid Score and Depression Score are measuring different constructs.

One of the reasons for the Perceptual Score and Paranoid Score not discriminating as well as the Total Score and Depression Score may be because of the inconsistency in weighting certain items. Twenty-six items are given a weighting of 5 points and four items are given a weighting of 2 points in the Total Score. In the Perceptual Score and Paranoid Score these same items are given a weighting of 1 point. There seems to be no explanation for this inconsistency in the manual (Kelm, Hoffer and Osmond, 1967). Consequently, it must be assumed that this is an oversight on the part of the authors of the test. If this inconsistency were eradicated, the Perceptual Score and the Paranoid Score could prove to be more valuable than in the present form. The inconsistency of weighting items does not affect the Depression Score since none of the items in the Depression Score are weighted at any time in the HOD.

In conclusion, it must be stated that the HOD does appear to have great potential value to school counsellors working with adolescents.



Through further research using the HOD on adolescents, adding items to the Paranoid Score, and consistently weighting certain items throughout the HOD, it would appear that the value of the HOD could be even greater than the results of this research project would indicate.

Paranoid Score. The scores on the Paranoid Score obtained by the drop-outs, underachievers, students seeking counselling, and students from the lower SES did not differ significantly from the control samples. One of the possible reasons for the lack of statistical significance is the structure of the Paranoid Score. In the first place, there are only fifteen items which constitute the Paranoid Score. Since the validity and reliability of a test are related to the number of items in the test, it is possible that there are not enough items to establish the validity of the Paranoid Score on an adolescent sample (Anastasi, 1968).

Secondly, of the fifteen items, there are at least three pairs of items which measure contrasting concepts. One pair is given as an example.

134. People interfere with my mind to harm me.

135. People interfere with my mind to help me.

It seems possible that some students would feel compelled to respond in the affirmative to one item of each of the three pairs. Since only the total number of true responses is recorded for each student and since students would probably mark true for only one of the paired items, the number of true responses from the criteria groups could approximate the number of true responses of the control samples on these six items. Consequently, these six items would not necessarily discriminate between criteria groups and control samples.

Thirdly, it must be recognized that five items of the HOD which get a weighting of 5 on the Total Score get a weighting of only 1 on





the Paranoid Score. If the weighting of these items was consistently followed throughout the HOD, it seems possible that the Paranoid Score would better discriminate between the criteria groups and the control groups. These three criticisms of the structure of the Paranoid Score seem to be reasonable and rather important when assessing the value of the Paranoid Score.

The student with a high absentee rate differed significantly from the student with a low absentee rate on the Paranoid Score. One possible reason for this could be the larger number of students included in this analysis. The mean scores from larger samples will more closely approximate the mean scores of the population from which the sample was drawn. The same will be true for the respective variances. It could also be stated that the standard error for the comparison of the differences between the means of larger samples is smaller in magnitude than for a comparison involving smaller samples. Consequently, the larger number of students in the high and low absentee groups may account for the significant difference in the two groups on the Paranoid Score.

With respect to the age variable, the mean Paranoid Score of the 17-year-old subjects was significantly larger than the mean Paranoid Score for the 15-year-old subjects and 16-year-old subjects, but was not significantly different from the 14-year-old subjects and the 18-year-old subjects. These results do not support the theory and/or research presented in Chapters II, III and IV, where it was suggested that the HOD scores tended to decrease with an increase in age. It must be remembered that the number of students in each age group was different. This may be a factor that accounts for different mean scores for each of the age groups and could explain the high Paranoid Score among the 17-year-old subjects in terms of sampling error.





Finally, it seems necessary to conclude that the Paranoid Score of the HOD, in its present form, has little value or validity when used on an adolescent sample. If some more items were added to the Paranoid Score and if certain items were consistently weighted throughout the test, the Paranoid Score could prove to have some validity on an adolescent sample.

### HOD and Perceptual Theory

The important role that perception plays in behavior, as suggested by Combs and Snygg (1959) and Rogers (1951), has been shown to be amenable to objective assessment through the use of the HOD. They theorize that individuals behave in a manner which is consistent with the way they perceive themselves, others and the environment in general. Thus, according to this theory, an individual with disturbed perceptions would behave in a disturbed manner. Since the HOD is reported to assess perceptual distortions and since, in this particular research the HOD scores discriminate specific criteria groups from control groups, the conclusion can be made that the HOD measures perceptual distortions which are related to behavioral problems among adolescents.

It must be remembered that the HOD was developed according to the medical model (Chapter III). The authors suggest that the individual who is experiencing perceptual distortions as measured by the HOD should be treated by orthomolecular psychiatry (Pauling, 1968). This is not to suggest that the school counsellors do nothing with individuals who obtain high HOD scores, but rather that the school counsellors work together with medical personnel in order to help the individuals with severe perceptual distortions and/or mood changes. The school counsellor could use HOD scores as criteria for referring students to the medical



personnel. With some students who are experiencing minimal perceptual distortions, psychological counselling may be very helpful to the student. It may be necessary for the school counsellor to adjust school programs for individuals with high HOD scores.

In essence, the cooperative efforts of school counsellors and medical personnel could help many students who are experiencing perceptual distortions and the HOD may become a useful tool in identifying students who are experiencing these perceptual distortions.

### HOD and Intelligence

A negative relationship exists between HOD scores and IQ scores on this adolescent sample. This was true for the students who wrote the Differential Aptitude Test (DAT), but was not true for the students who wrote the Henmon-Nelson (HN) and Lorge-Thorndike (LT) IQ tests. With a correlation coefficient of .75 to .79 between the DAT and the HN and LT IQ tests it seems strange that a negative relationship was not obtained between the HN and LT IQ tests and the HOD. The time factor is the one factor which would seem to explain the lack of a consistent relationship between the HOD and IQ tests. It will be recalled that the DAT was administered to the students less than two months prior to the writing of the HOD, whereas the HN and LT tests had been administered within a three year period of time prior to the writing of the HOD. Because of the time lapse between the writing of the HN and Lt and the HOD, the IQ scores from the HN and LT tests do not seem to reflect the extent of the perceptual distortion which the students presently are experiencing. On the other hand the DAT scores are reflecting the extent of perceptual distortions which the students are presently experiencing. Consequently, the relationship between the DAT scores and HOD scores is negative and the relationship between the HN and Lt



scores and the HOD is very small and not significant. This conclusion supports the theory of Combs (1952) presented in Chapter IV where he suggests that the extent of perceptual distortion will be reflected in the IQ scores. The higher the perceptual distortions the lower the IQ score, and conversely, the lower the perceptual distortion the higher the IQ score. From this particular research finding, it seems very important to consider the recency of IQ scores when making academic predictions about students in terms of their IQ score.

#### HOD and Age-Sex

The Total Score, Perceptual Score, Paranoid Score, and Depression Score means were significantly greater for the females than for the males. This difference was predicted in Chapter IV.

The prediction that the HOD scores would decrease with age was not confirmed. One possible explanation for this can be made from the research of Jorgensen and Howell (1969). They suggested that the self-ideal self congruence would decrease during the latency period - ages 5 to 12 - and stabilize from ages 13 to 18. This would suggest that the extent of perceptual distortion among the students aged 5 to 12 years would be greater than the perceptual distortion among the adolescents. If the stabilizing of the self ideal-self congruence as suggested by Jorgensen and Howell (1969) is gradual, then the actual mean scores on the HOD for the 14 to 18 age group may not be significantly different. Also, it must be recognized that the number of students in each age group was different, even though the sample was randomly selected.

With the large difference in the number of students for each age group, it is possible to account for the significant difference in mean





scores obtained by the 17-year-old males and the mean scores obtained by both 15- and 16-year-old males in terms of sampling error.

#### HOD and Drop-Outs

The HOD scores obtained by the drop-outs were not significantly different from the HOD scores of the control sample. It is important to remember that the basis for hypothesizing a significant difference between the drop-outs and the control sample was largely on clinical observations. The research evidence on the drop-outs and non-drop-outs was inconclusive (Chapter IV).

The conclusion about drop-outs from this study is that drop-outs are not disturbed as measured by the HOD. This conclusion can be further supported by the research evidence presented in Chapter IV and also a study by Vincent (1965). Vincent investigated how successful drop-outs were both vocationally and economically. He concluded that drop-outs were not penalized for dropping out of school, but that they had adjusted to the adult society with little difficulty. He even suggested that had these drop-outs stayed at school, their frustrations, boredom and careless work habits could have become part of their personal characteristics. Is it possible that the concern for the drop-out is actually a concern as to why these students do not reach one of society's goals rather than a real concern for the drop-out? This seems to be a valid question in the light of the above discussion.

It is obvious, however, that the drop-out in this sample is not experiencing perceptual distortions as measured by the HOD. To the extent that the HOD score distinguishes between a disturbed and a normal person, it can be concluded that the drop-out is not a disturbed person.





SES, Underachievers, Seekers of Counselling and HOD

The Total Score and Depression Score on the HOD were significantly higher for the underachievers, students seeking counselling, and students from the lower SES group than for the control samples and students from the upper SES group. This difference was predicted on the basis of the research evidence and theory presented in Chapters II and IV.

The Perceptual Score on the HOD discriminated between the underachievers and a control sample, and the lower and upper SES groups. The Perceptual Score did not discriminate between the students seeking counselling and the students not seeking counselling. One possible explanation for this lack of discrimination can be suggested in terms of the research presented in Chapter IV. Cook and Kiesler (1967) reported that the neurotic triad of the MMPI distinguished clients from non-clients at the .05 level of significance. The neurotic triad consists of the Depression Scale, Hypochondriasis Scale and Hysteria Scale (Anastasi, 1968). Since the HOD also measures depression and since the Depression Score of the HOD is included in the Total Score of the HOD, it seems reasonable to assume that students who seek counselling are basically depressed and do not have the perceptual distortion as measured by the Perceptual Score. The items of the Depression Score may account for the variance in the Total Score. The same may be true for the items of the Paranoid Score even though the Paranoid Score did not significantly distinguish students seeking counselling from students not seeking counselling.



The Paranoid Score did not distinguish underachievers, students who sought counselling, and students from the lower SES group from control samples and students from the upper SES group. A possible explanation for this has already been suggested in this chapter.

The conclusion to be drawn from this research is that the HOD, but not necessarily all the sub-scores, can be used to discriminate underachievers from achievers, students seeking counselling from students not seeking counselling, and lower SES groups from upper SES groups. Underachievers, students seeking counselling, and lower SES students are more disturbed than achievers, students not seeking counselling and upper SES students as measured by the HOD.

#### HOD and Special Sample

The Total Score, Perceptual Score, Paranoid Score, and Depression Score of the HOD discriminated between the Special Sample and the Control Sample. This suggests that the students referred to the Visiting Psychologists are significantly more disturbed than the students not referred to the Visiting Psychologists. It must be remembered that the analysis of the means obtained by these two groups did not control for the IQ variable. The mean age of the two groups was not significantly different. The sex variable was controlled by having an equal number of females in each of the groups and an equal number of males in the two groups. Since it seems unlikely that the IQ variable would account for the differences in mean HOD scores, the conclusion can be made that the extent of perceptual distortion and mood among students of the Special Sample was greater than that of the Control Sample.



The range of the Total Scores obtained by the Special Sample is very large. Consequently, it is impossible to suggest from this research a cut-off score for referring students to Visiting Psychologists. Further research may lead to a cut-off score on the HOD for referring to Visiting Psychologists.

#### HOD and Absenteeism

The prediction that the HOD scores would discriminate between students with a high rate of absenteeism and a low rate of absenteeism was confirmed for Total Score, Perceptual Score, Paranoid Score, and Depression Score. Since this result was predicted no further explanation seems necessary. The implications of this finding are rather interesting. The attention given to students with a fairly high rate of absenteeism seems to be justified. It does seem advisable, however, to give these students counselling and/or orthomolecular treatment rather than apply institutional pressures to deal with the problem of absenteeism. In dealing with the perceptual distortions and mood of students with a high rate of absenteeism, the counsellor and/or doctor may be able to help these students deal with their problems and eventually the rate of absenteeism would also decrease (Snygg and Combs, 1959). Furthermore, the items on the HOD that students mark "true" may give the counsellor an idea of the specific perceptual distortions that students are experiencing. This could facilitate the counselling process.

#### HOD and MMPI

As predicted in Hypotheses 8 and 9, the Total Score, Paranoid Score, and Depression Score of the HOD correlated positively with the Schizophrenia Scale, Paranoia Scale and Depression Scale of the MMPI respectively. Since these scales correlate, it seems necessary to





justify the use of the HOD over the MMPI in a high school. One rather important advantage of the HOD over the MMPI is the length of time required to complete the HOD. The HOD has 145 items and requires approximately 30 minutes to complete while the MMPI has 550 items and requires approximately 90 minutes to complete. This difference in the time required to complete the test seems to be an advantage, particularly when the mean scores on the HOD obtained by the sample in this research discriminated so many of the criteria groups from the control samples. Then too, the research on the HOD has indicated a specific treatment. Another advantage of the HOD over the MMPI is the Perceptual Score. The Perceptual Score seems to be adding a dimension to the study of perceptual distortion which has been very valuable in helping students with school problems (Green, 1969). The following two items are given as examples of this dimension.

21. Sometimes when I read the words begin to look funny - they move around or grow faint.

24. Sometimes objects pulsate when I look at them.

Green (1969) reports that a child's affirmative response to similar items was reflected in poor school achievement, particularly in reading. When, through medication, these letters and objects remained stationary, the child's achievement also improved. This finding may prove to be very valuable in helping children and adolescents in their school performance.

These advantages would warrant the use of the HOD over the MMPI in the school setting. Further research is probably necessary in order to more fully assess the aforementioned advantages.



### Other Possibilities for Research

A number of research topics can be suggested from the preceding discussion.

1. Since the Paranoid Score was not as good a discriminator between criteria groups and control samples as the other sub-scores, it would be interesting to add a few items to the Paranoid Score and then check the validity of this score on another adolescent sample.

2. The negative relationship obtained between the DAT and the HOD would lead to the speculation that IQ scores may fluctuate quite considerably over the latency and adolescent period of development. This fluctuation could possibly be accounted for by a corresponding fluctuation in perceptual distortions as measured by the HOD. A cross-sectional study of students from the ages of 12 to 18 using the HOD and an IQ test could assess these fluctuations.

3. It seems necessary to investigate the extent to which the megavitamin and diet treatment of perceptual distortion, as suggested by Hoffer and Osmond (Chapter III), would affect the underachiever, students who are seeking counselling, students with a high absentee rate and students from the lower socio-economic status.

4. The value of the HOD in monitoring the effects of counselling requires investigation, particularly for counsellors who adhere to a perceptual theory in counselling.

5. The extent to which the counselling process could be facilitated by the counsellor knowing which specific items on the HOD a client responded to in the affirmative needs to be investigated.



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## APPENDIX A

- A-1 HOD TEST ITEMS
- A-2 PERCEPTUAL SCORE ITEMS
- A-3 PARANOID SCORE ITEMS
- A-4 DEPRESSION SCORE ITEMS
- A-5 SHORT FORM ITEMS
- A-6 ADMINISTRATION INSTRUCTIONS
- A-7 SCORING PROCEDURES
- A-8 STANDARD SCORE SHEET





## APPENDIX A-1

### HOD TEST ITEMS

1. People's faces sometimes pulsate as I watch them.
2. People's faces seem to change in size as I watch them.
3. People's eyes seem very piercing and frightening.
4. People watch me a lot more than they used to.
5. People watch me all the time.
6. I feel rays of energy upon me.
7. Most people have halos (areas of brightness) around their heads.
8. Sometimes I have visions of people when I close my eyes.
9. Sometimes I have visions of people during the day when my eyes are open.
10. Sometimes I have visions of animals or scenes.
11. Sometimes I have visions of God or of Christ.
12. Sometimes the world seems unreal.
13. Sometimes I feel very unreal.
14. When I look at things like tables and chairs they seem strange.
15. When I look at people they seem strange.
16. Often when I look at people they seem to be like someone else.
17. Now and then when I look in the mirror my face changes and seems different.
18. My body now and then seems to be altered -- too big or too small, out of proportion.
19. Sometimes the world becomes very bright as I look at it.
20. Sometimes the world becomes very dim as I look at it.
21. Sometimes when I read the words begin to look funny -- they move around or grow faint.
22. Sometimes when I watch TV the picture looks very strange.
23. Sometimes I feel there is a fog or mist shutting me away from the world.
24. Sometimes objects pulsate when I look at them.
25. Pictures appear to be alive and to breathe.
26. I often see sparks or spots of light floating before me.
27. My hands or feet sometimes seem much too large for me.
28. I sometimes feel that I have left my body.
29. I often feel I have left my body.
30. My sense of hearing is now more sensitive than it ever has been.
31. I now have more trouble hearing people.
32. I often have singing noises in my ears.
33. I often hear or have heard voices.
34. I often hear or have heard voices talking about or to me.
35. I have often felt that there was another voice in my head.
36. I have often heard strange sounds, e.g. laughing, which frighten me.
37. I have heard voices coming from radio, television, or tape recorders talking about me.
38. My sense of touch has now become very keen.



39. I sometimes have sensations of crawly things under my skin.
40. I sometimes feel rays of electricity shooting through me.
41. Some of my organs feel dead.
42. I sometimes feel my stomach is dead.
43. I sometimes feel my bowels are dead.
44. I sometimes feel I am being pinched by unseen things.
45. I now have trouble feeling hot or cold things.
46. I sometimes feel strange vibrations shivering through me.
47. Some foods which never tasted funny before do so now.
48. I can taste bitter things in some foods like poison.
49. Foods taste flat and lifeless.
50. I have more difficulty tasting foods now.
51. Water now has funny tastes.
52. I can no longer tell how much time has gone by.
53. The days seem to go by very slowly.
54. Some days move by so quickly it seems only minutes have gone by.
55. I have much more trouble keeping appointments.
56. I have much more trouble getting my work done on time.
57. Things smell very funny now.
58. My body odor is much more noticeable than it once was.
59. My body odor is much more unpleasant now.
60. I sweat much more now than when I used to.
61. I can no longer smell perfumes as well as I used to.
62. Foods smell funny now.
63. At times my mind goes blank.
64. At times my ideas disappear for a few moments and then reappear.
65. I am bothered by very disturbing ideas.
66. My mind is racing away from me.
67. At times I am aware of people talking about me.
68. There are some people trying to do me harm.
69. There is some plot against me.
70. I have a mission in life given to me by God.
71. At times some other people can read my mind.
72. I can read other people's minds.
73. At times when I come into a new situation, I feel strongly the situation is a repeat of one that happened before.
74. I now become easily confused.
75. I am now much more forgetful.
76. I now am sick.
77. I can not make up my mind about things that before did not trouble me.
78. My thinking gets all mixed up when I have to act quickly.
79. I very often get directions wrong.
80. Strange people or places frighten me.
81. People are watching me.
82. A cow is like a horse because they are both in North America, not because they are both animals.
83. A cow is like a horse because they are animals, not because they are in North America.
84. A chair is like a table because they have four legs, not because they are usually used together.





85. A chair is like a table because they are usually used together rather than because they both have four legs.
86. A dress is like a glove because they belong to women rather than because they are articles of clothing.
87. A dress is like a glove because they are articles of clothing rather than because they are owned by women.
88. A pen is like a pencil because they are like sticks, rather than because they are used for writing.
89. A pen is like a pencil because they are both used for writing rather than because they both are like sticks.
90. An orange is like a banana because they both have skins rather than because they are fruit.
91. An orange is like a banana because they are fruit, not because they both have skins.
92. An axe is like a saw because they have handles, rather than because they are tools.
93. An axe is like a saw because they are tools, rather than because they have handles.
94. The eye is like the ear because they are on the head rather than because they are sense organs.
95. The eye is like the ear because they are sense organs rather than because they are on the head.
96. Air is like water because they are both cold rather than because they are needed for life.
97. Air is like water because they are needed for life rather than because they are both cold.
98. Praise is like punishment because they both start with p rather than because they are given to people.
99. Praise is like punishment because they are both given to people rather than because they start with the letter p.
100. A fly is like a tree because they both require humans rather than because they are living things.
101. A fly is like a tree because they both are living things rather than because they both require humans.
102. I very often am very tired.
103. I very often suffer from severe nervous exhaustion.
104. I very often have great difficulty falling asleep at night.
105. I usually feel alone and sad at a party.
106. I usually feel miserable and blue.
107. Life seems entirely hopeless.
108. I am very painfully shy.
109. I am often misunderstood by people.
110. I have to be on my guard with friends.
111. Very often friends irritate me.
112. My family irritates me very much.
113. I am often very shaky.
114. I am constantly keyed up and jittery.
115. Sudden noises make me jump or shake badly.
116. I often become scared of sudden movements or noises at night.
117. My hands or foot sometimes feel far away.
118. My hands or foot often look very small now.





119. Cars seem to move very quickly now. I can't be sure where they are.
120. When I am driving in a car objects and people change shape very quickly. They didn't used to.
121. I often hear my thoughts inside my head.
122. I often hear my own thoughts outside my head.
123. I hear my own thoughts as clearly as if they were a voice.
124. My bones often feel soft.
125. Cigarettes taste queer now.
126. Other people's cigarette smoke smells strange -- like a gas.
127. The world has become timeless for me.
128. Time seems to have changed recently, but I am not sure how.
129. Other people smell strange.
130. People look as if they were dead now.
131. I feel as if I am dead.
132. People are often envious of me.
133. Many people know that I have a mission in life.
134. People interfere with my body to harm me.
135. People interfere with my body to help me.
136. People interfere with my mind to harm me.
137. People interfere with my mind to help me.
138. I know that most people expect a great deal of me.
139. Lately I often get frightened when driving myself in a car.
140. I get more frightened now when I am driven in a car by others.
141. I don't like meeting people -- you can't trust anyone now.
142. More people admire me now than ever before.
143. Most people hate me.
144. I find that past, present and future seem all muddled up.
145. I am not sure who I am.



## APPENDIX A-2

### PERCEPTUAL SCORE ITEMS

1. People's faces sometimes pulsate as I watch them.
2. People's faces seem to change in size as I watch them.
4. People watch me a lot more than they used to.
5. People watch me all the time.
7. Most people have halos (areas of brightness) around their heads.
9. Sometimes I have visions of people during the day when my eyes are open.
10. Sometimes I have visions of animals or scenes.
11. Sometimes I have visions of God or of Christ.
12. Sometimes the world seems unreal.
13. Sometimes I feel very unreal.
14. When I look at things like tables and chairs they seem strange.
15. When I look at people they seem strange.
17. Now and then when I look in the mirror my face changes and seems different.
18. My body now and then seems to be altered -- too big or too small, out of proportion.
21. Sometimes when I read the words begin to look funny -- they move around or grow faint.
23. Sometimes I feel there is a fog or mist shutting me away from the world.
24. Sometimes objects pulsate when I look at them.
27. My hands or feet sometimes seem much too large for me.
28. I sometimes feel that I have left my body.
29. I often feel I have left my body.
33. I often hear or have heard voices.
34. I often hear or have heard voices talking about or to me.
35. I have often felt that there was another voice in my head.
36. I have often heard strange sounds, e.g. laughing which frighten me.
37. I have heard voices coming from radio, television, or tape recorders talking about me.
39. I sometimes have sensations of crawly things under my skin.
40. I sometimes feel rays of electricity shooting through me.
41. Some of my organs feel dead.
42. I sometimes feel my stomach is dead.
43. I sometimes feel my bowels are dead.
44. I sometimes feel I am being pinched by unseen things.
48. I can taste bitter things in some foods like poison.
51. Water now has funny tastes.
52. I can no longer tell how much time has gone by.
54. Some days move by so quickly it seems only minutes have gone by.
57. Things smell very funny now.
62. Foods smell funny now.
117. My hands or feet sometimes feel far away.



- 118. My hands or feet often look very small now.
- 119. Cars seem to move very quickly now. I can't be sure where they are.
- 120. When I am driving in a car objects and people change shape very quickly. They didn't used to.
- 121. I often hear my thoughts inside my head.
- 122. I often hear my own thoughts outside my head.
- 123. I hear my own thoughts as clearly as if they were a voice.
- 124. My bones often feel soft.
- 125. Cigarettes taste queer now.
- 126. Other people's cigarette smoke smells strange -- like a gas.
- 127. The world has become timeless for me.
- 128. Time seems to have changed recently, but I am not sure how.
- 129. Other people smell strange.
- 130. People look as if they were dead now.
- 131. I feel as if I am dead.
- 144. I find that past, present and future seem all muddled up.



## APPENDIX A-3

### PARANOID SCORE ITEMS

- 4. People watch me a lot more than they used to.
- 5. People watch me all the time.
- 34. I often hear or have heard voices talking about or to me.
- 67. At times I am aware of people talking about me.
- 68. There are some people trying to do me harm.
- 69. There is some plot against me.
- 81. People are watching me.
- 132. People are often envious of me.
- 134. People interfere with my body to harm me.
- 135. People interfere with my body to help me.
- 136. People interfere with my mind to harm me.
- 137. People interfere with my mind to help me.
- 141. I don't like meeting people -- you can't trust anyone now.
- 142. More people admire me now than ever before.
- 143. Most people hate me.





## APPENDIX A-4

### DEPRESSION SCORE ITEMS

- 20. Sometimes the world becomes very dim as I look at it.
- 31. I now have more trouble hearing people.
- 49. Foods taste flat and lifeless.
- 53. The days seem to go by very slowly.
- 56. I have much more trouble getting my work done on time.
- 77. I can not make up my mind about things that before did not trouble me.
- 78. My thinking gets all mixed up when I have to act quickly.
- 102. I very often am very tired.
- 103. I very often suffer from severe nervous exhaustion.
- 104. I very often have great difficulty falling asleep at night.
- 105. I usually feel alone and sad at a party.
- 106. I usually feel miserable and blue.
- 107. Life seems entirely hopeless.
- 111. Very often friends irritate me.
- 112. My family irritates me very much.
- 113. I am often very shaky.
- 114. I am constantly keyed up and jittery.
- 115. Sudden noises make me jump or shake badly.



## APPENDIX A-5

### SHORT FORM ITEMS

- 3. People's eyes seem very piercing and frightening.
- 5. People watch me all the time.
- 10. Sometimes I have visions of animals or scenes.
- 16. Often when I look at people they seem to be like someone else.
- 28. I sometimes feel that I have left my body.
- 33. I often hear or have heard voices.
- 34. I often hear or have heard voices talking about or to me.
- 35. I have often felt that there was another voice in my head.
- 37. I have heard voices coming from radio, television, or tape recorders talking about me.
- 68. There are some people trying to do me harm.
- 69. There is some plot against me.
- 121. I often hear my thoughts inside my head.
- 122. I often hear my own thoughts outside my head.
- 123. I hear my own thoughts as clearly as if they were a voice.
- 132. People are often envious of me.
- 136. People interfere with my mind to harm me.
- 141. I don't like meeting people -- you can't trust anyone now.



## APPENDIX A-6

### ADMINISTRATION INSTRUCTIONS

This inventory consists of numbered statements. Read each statement and answer it either True or False according to how well it describes what is happening to you.

You are to put your answers on the answer sheet. Look at the example of the answer sheet shown at the right. If the statement is True as applied to you, draw a circle around the T opposite the number of that statement on the answer sheet.

(See item number 26 at the right.) If, for example, statement number 37 is False as applied to you, draw a circle around the F opposite number 37 on the answer sheet. (See number 37 in the above example.)

Example of how  
to record an  
answer

26. ☒ T ☐ F  
37. ☐ T ☒ F

Answer every statement.

Each statement in this booklet is numbered, but the numbers are not arranged in consecutive order. The order of the numbers in the booklet and on the answer sheet, however, are the same. In marking your answers on the answer sheet, be sure that the number of the statement in the booklet is the same as the number you are answering on the answer sheet. Erase any answer you wish to change. Do not make any marks on this booklet.

Remember, answer every statement as it applies to you, and be sure that the number of each statement in the booklet is the same number you are answering on the answer sheet.

NOW OPEN THE BOOKLET AND GO AHEAD.





## APPENDIX A-7

### SCORING

A standard score sheet and keys are recommended for scoring the responses. With either the card or booklet form, only the items answered true are recorded on the score sheet by placing an "X" on the item number. Each key is then successively placed on the Score Sheet and the number of Xs are counted.

Six scores are calculated: Total Score (TS), Perceptual Score (PerS), Paranoid Score (PS), Depression Score (DS), Ratio Score (RS) and a Short Form (SF) score. These are discussed in Chapter IV. One scoring key is used to obtain each score, except TS for which two are required; none are needed for RS. To obtain the TS Key A is placed on the Score Sheet and the number of Xs showing through the perforations are counted. These are all multiplied by 5, except the four that are circled and connected with a line which are multiplied by 2. Key B of the TS is then placed on the Score Sheet and the number of Xs counted. Each of these receives only one point. The three values totalled, constitute the TS. One key is used for each of the remaining scores (PerS, PS, DS, SF) with each X receiving one point. The Score Sheet provides space for recording these scores. The RS is obtained by dividing TS by DS and when DS is zero multiply TS by 2. This score is discussed in Chapters IV, V and VI.

The highest possible scores are: TS=243, PerS=53, PS=15, DS=18, RS=450 and SF=17.



# APPENDIX A-8

HOD

## BOOKLET ANSWER SHEET

Name . . . . . Sex . . . AGE . . . DATE . . . .

47. T F	110. T F	21. T F	32. T F	76. T F	57. T F
143. T F	82. T F	52. T F	42. T F	118. T F	144. T F
68. T F	78. T F	127. T F	124. T F	94. T F	12. T F
61. T F	126. T F	116. T F	38. T F	89. T F	105. T F
60. T F	50. T F	43. T F	9. T F	113. T F	131. T F
59. T F	49. T F	58. T F	100. T F	104. T F	29. T F
134. T F	7. T F	14. T F	17. T F	48. T F	26. T F
66. T F	35. T F	37. T F	8. T F	130. T F	97. T F
81. T F	31. T F	137. T F	16. T F	112. T F	99. T F
73. T F	140. T F	11. T F	33. T F	139. T F	65. T F
10. T F	6. T F	34. T F	111. T F	13. T F	83. T F
70. T F	28. T F	25. T F	40. T F	119. T F	128. T F
2. T F	1. T F	145. T F	101. T F	23. T F	79. T F
86. T F	123. T F	138. T F	71. T F	91. T F	72. T F
5. T F	109. T F	41. T F	120. T F	93. T F	77. T F
46. T F	45. T F	30. T F	75. T F	87. T F	74. T F
15. T F	27. T F	4. T F	56. T F	95. T F	63. T F
22. T F	39. T F	108. T F	115. T F	102. T F	142. T F
141. T F	64. T F	20. T F	55. T F	53. T F	96. T F
117. T F	88. T F	114. T F	90. T F	24. T F	67. T F
107. T F	85. T F	54. T F	98. T F	129. T F	
106. T F	84. T F	3. T F	132. T F	44. T F	
51. T F	19. T F	103. T F	62. T F	18. T F	
121. T F	133. T F	36. T F	136. T F	135. T F	
92. T F	80. T F	125. T F	69. T F	122. T F	



APPENDIX B

B-1 LETTER TO PARENTS RE MMPI TESTING



APPENDIX B-1

January 26, 1971

Dear \_\_\_\_\_,

During the month of February, 1971, Lloyd J. Njaa, a graduate student of the University of Alberta, would like to administer the Minnesota Multiphasic Personality Inventory (MMPI) to fifty students. The fifty students have been randomly selected from Grades X and XI.

\_\_\_\_\_ was selected as one of the fifty. The purpose of this testing is to see how High School students score on this particular test. The results from this testing will be used for research only, and will never be used against your child.

If you do not wish your child to take part in this test, please indicate your wish by returning this letter to me. If I do not hear from you by February \_\_\_\_\_, I will assume you have no objection to having your child participate in this test.

I would solicit your cooperation with this research.

Yours truly,

G. te Kampe,  
Assistant Principal





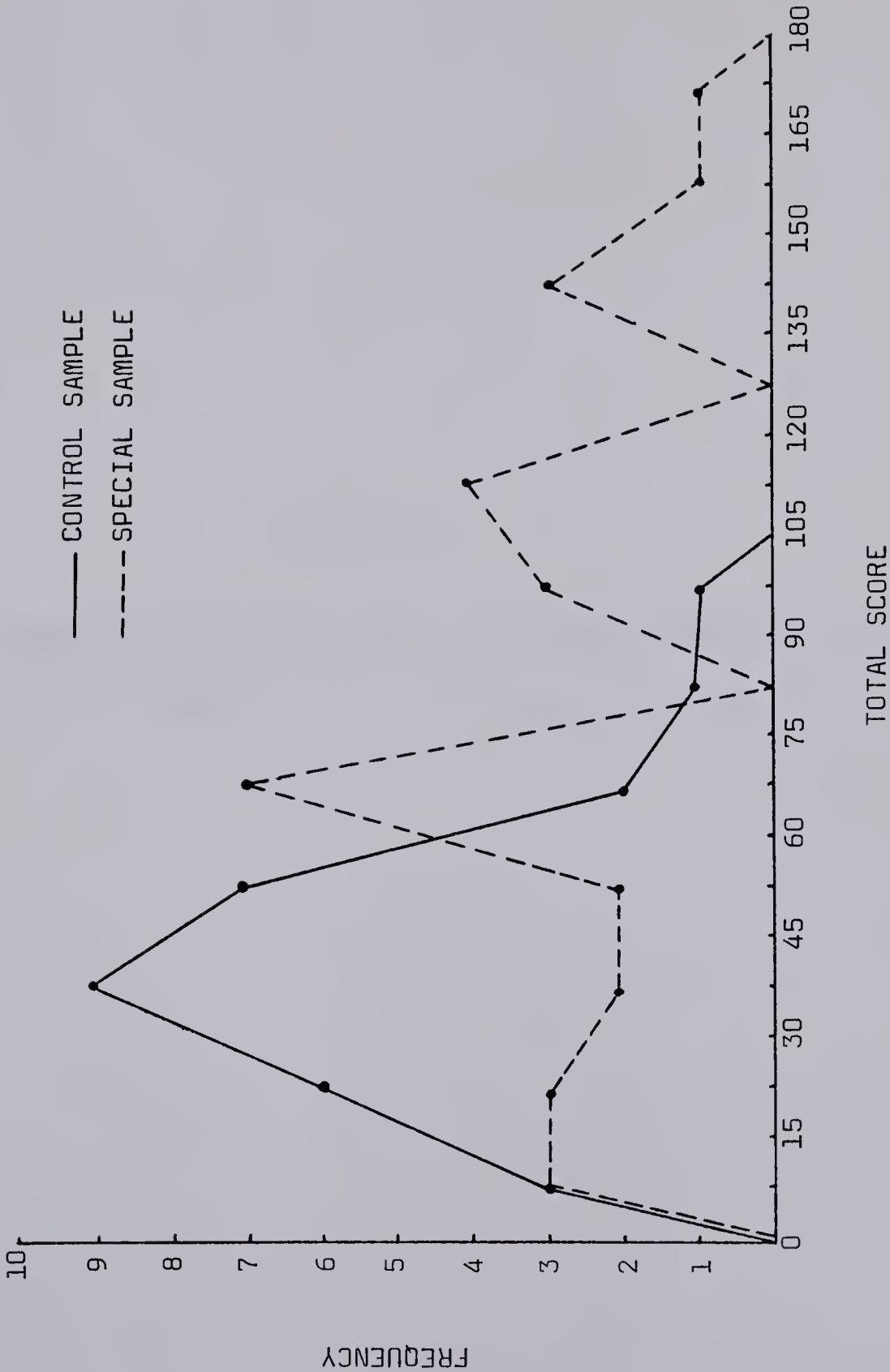
## APPENDIX C

C-1 FREQUENCY POLYGON ON TOTAL SCORES OF  
SPECIAL SAMPLE AND CONTROL SAMPLE



APPENDIX C

FREQUENCY POLYGON OF TOTAL SCORES ON THE  
HOD OF SPECIAL SAMPLE AND CONTROL SAMPLE





## APPENDIX D

D-1 INTERCORRELATION OF TOTAL SCORE, PERCEPTUAL SCORE, PARANOID  
SCORE AND DEPRESSION SCORE OF THE HOD ON THE LARGE SAMPLE





APPENDIX D

INTERCORRELATION OF TOTAL SCORE, PERCEPTUAL SCORE, PARANOID  
SCORE AND DEPRESSION SCORE OF THE HOD ON THE LARGE SAMPLE

		1	2	3	4
TS	1	1.00			
PerS	2	.93	1.00		
PS	3	.50	.45	1.00	
DS	4	.78	.68	.36	1.00





**B30021**